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METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 205. JANUARY, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.46, 25th, 9 A.
Minimum reduced to freezing, 28.94, 4th, 12 M.
Reduced† maximum reading, 30.78, 25th, 9 A.
Reduced† minimum reading, 29.25, 4th, 12 M.
Mean semi-daily reduced, ... 30.094
Monthly range, ... 1.53

****Air Temperature.*** In Degrees Fahr.

Highest, ... 60.0, 21st, 4 P.
Lowest, ... 3.5, 10th, 7:30 A.
Mean hourly, ... 29.6
Mean of means of max. and min., ... 30.2
Mean sensible (wet bulb), ... 26.2
Monthly range, ... 56.5
Highest mean daily, ... 52.6, 23d
Lowest mean daily, ... 11.5, 10th
Mean maximum, ... 38.1
Mean minimum, ... 22.3
Mean daily range, ... 15.8
Greatest daily range, ... 32.0, 30th
Least daily range, ... 6.5, 14th

Humidity.

Mean dew point, ... 20.8
Mean force of vapor, ...168
Mean relative humidity, ... 74.8

Precipitation. In inches.

Total precipitation, ... 2.18
Number of days on which .01 inch or more rain or melted snow fell, ... 10
Total snow in inches, ... 5
Snow on ground at end of month, . . . none

Wind.

Total movement, ... 5706 m.
Greatest daily movement, ... 433 m., 17th
Least daily movement, ... 2 m., 11th
Mean daily movement, ... 184 m.
Mean hourly velocity, ... 7.7 m.
Maximum pressure per square foot, 8.0 lbs.= 45 m. per hour, 28th, 10 P., N.
Maximum velocity for 5 minutes, 30 m. per hour 7th, 3 P., W.N.W.
Prevailing Direction, West, Northwest.

Summary.

West, Northwest, ... 19 per cent.
North, ... 13 " "
North, Northwest, ... 13 " "
South, ... 10 " "
Southwest, ... 10 " "
South, Southeast, ... 10 " "
Other directions, ... 25 " "

Weather.

Mean cloudiness observed, ... 51 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 168 hrs.=57 per cent.
Number of clear days, ... 6
Number of fair days, ... 10
Number of cloudy days, ... 15

Bright Sunshine.

Number of hours recorded, . . 126 hrs.=43%

Rain, 3d, 4th, 12th, 15th, 16th, 20th, 23d, 24th.

Gales, 35 miles or more per hour, 39 m. 6th, W.N.W.; 36m. 7th, W.; 35m., 17th, W.; 35m. 24th, N.N.W.; 45m. 28th, N.

Snow, 1st, 3d, 5th, 6th, 8th, 14th, 17th, 18th, 20th.

Sleet, ... 3d

Days of Sleighing, ... 8

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

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DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.18	29.99	30.124	35.0	3 P	26.5	4 A	30.7	31.3	26.5	2.7
2	30.37	30.18	30.344	34.0	3 P	21.0	7 A	27.5	27.8	23.0	7.0
3	30.56	29.95	30.233	28.0	5 P	16.0	7 A	22.0	23.3	20.5	5.0
4	29.95	29.25	29.344	38.0	5 P	24.5	1 A	31.3	32.5	32.5	0.0
5	29.71	29.39	29.643	39.0	1 P	32.0	12 P	35.5	35.8	32.0	1.0
6	29.84	29.61	29.751	37.0	2 P	29.0	12 P	33.0	31.6	28.3	2.0
7	30.18	29.84	30.077	34.0	2 P	22.0	7:30 A	28.0	27.5	22.0	3.1
8	30.25	30.06	30.186	24.0	2 P	14.0	12 P	19.0	20.1	16.3	5.0
9	30.26	29.98	30.123	23.0	4 P	5.0	7:30 A	14.0	12.3	5.5	6.3
10	30.49	30.26	30.454	24.0	3:30 P	3.5	7:30 A	13.7	11.5	8.5	5.5
11	30.61	30.45	30.551	27.0	4 P	5.0	7:30 A	16.0	15.3	12.5	4.5
12	30.45	30.25	30.301	41.0	4 P	21.0	0 A	31.0	31.6	31.5	2.3
13	30.48	30.25	30.376	35.0	3 P	25.5	7:30 A	30.3	29.8	24.5	5.3
14	30.25	30.12	30.193	31.5	5 P	25.0	12 M	28.3	27.1	25.5	0.0
15	30.30	30.01	30.230	34.0	4:30 P	23.5	2 A	28.7	29.3	29.5	1.5
16	30.01	29.48	29.594	43.5	5 P	32.5	0 A	38.0	37.0	34.0	1.0
17	30.01	29.51	29.832	36.0	1:30 P	28.0	12 P	32.0	33.4	29.7	2.0
18	29.89	29.61	29.738	39.5	5 P	27.0	1 A	33.3	31.0	28.7	0.0
19	30.39	29.74	30.179	36.0	4 P	23.0	7 A	29.5	28.0	23.7	8.3
20	30.39	30.13	30.287	37.0	12 P	20.0	7 A	28.5	24.8	24.7	0.0
21	30.25	30.11	30.166	60.0	4 P	37.0	12 P	48.5	44.9	41.5	6.0
22	30.27	30.17	30.217	53.0	6 P	35.0	5 A	44.0	43.0	44.0	0.0
23	30.17	29.92	30.014	59.0	6 P	47.0	12 P	53.0	52.6	53.7	0.0
24	30.60	30.01	30.372	40.0	4 P	24.0	12 P	32 0	35.5	28.5	8.2
25	30.78	30.60	30.745	30.0	4 P	15.5	7:30 A	22.7	22.0	17.7	9 0
26	30.72	30.44	30.561	42.0	4 P	12.0	7 A	27 0	23.7	19.0	8.9
27	30.46	29.96	30.181	48.0	3:30 P	17.0	7 A	32.5	29.2	24.5	7.3
28	29 96	29.56	29.703	48.0	3 P	22.0	6 A	35.0	33.6	27.0	4.0
29	30.37	29.75	30.177	32.0	6 P	12.0	7:30 A	22.0	22.6	13.3	9.3
30	30.26	30.18	30 173	47.0	4 P	15.0	2 A	31.0	31.1	28.5	8.5
31	30.18	29.88	29.963	46.0	4 P	32.0	7 A	39.0	37.4	35.3	2.6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	19.0	.168	61.5	W.N.W.	220	4.0	28	4 P	0 A	2 P		T
2	18.0	.134	77.5	N.N.W.	267	3.5	26	2 A				
3	16.5	.120	79.0	W.N.W.	62	0.0	—	—	5.30 P	12 P	*	3
4	30.5	.190	92.5	N.	100	1.5	17	10 P	0 A	6 P	.93	
5	26.5	.202	72 5	W.	282	5.5	33	10 A	1 P			T
6	23.5	.182	62.5	W.	233	7.5	39	8 P	1 P	3 P		T
7	13.0	.140	58.0	W.N.W.	390	6.5	36	1 P				
8	11.0	.102	74.5	N.W.	388	4.0	28	11 P	5 P	12 P	.03	½
9	−10.0	.065	42.5	W.N.W.	202	5.5	33	3 A				
10	−2.0	.075	56.5	S.	50	0.0	—	—				
11	7.5	.090	75.0	S.	2	0.0	—	—				
12	29.0	.190	82.5	N.W.	60	1.5	17	10 A	3 A	12 M	.42	
13	17.0	.152	64.0	N.N.E.	247	3.5	26	4 A				
14	23.0	.145	85.5	N.N.E.	293	5.5	33	5 A	6 A	1 P	.03	½
15	27.5	.167	92.0	S.S.W.	108	1.5	17	10 P	8 P	12 P	T	
16	31.0	.221	81.5	S.W.	172	1.5	17	9 P	0 A	12 P	.33	
17	24.5	.184	73.0	W.N.W.	433	6.0	35	1 P	8 A	12 M		T
18	27.0	.168	87.5	S.S.W.	150	1.5	17	11 A	6 A	11 A	.04	½
19	18.5	.140	76.0	N.N.W.	86	1.0	14	11 A				
20	22.5	.142	88.5	N.	34	0.5	10	10 P	5 A	12 P	.10	½
21	40 5	.264	96.0	S.S.E.	116	0.5	10	3 A				
22	43.5	.295	96.5	S.S.E.	37	1.5	17	12 P				
23	53.0	.427	95.5	S.	336	4.0	28	4 P	9 P	12 P	.12	
24	22.0	.180	65.5	N.N.W.	339	6.0	35	9 P	0 A	3 A	.18	
25	11.5	.119	71.0	N.N.W.	286	4.5	30	9 A				
26	15.5	.117	78.0	S.W.	19	0.0	—	—				
27	21.5	.146	79.5	S.W.	29	0.0	—	—				
28	15.5	.178	55.0	S.S.E.	81	8.0	45	10 P				
29	−6.5	.099	40.5	N.	304	4.5	30	7 A				
30	24.5	.177	77.0	S.W.	283	5 5	33	12 M				
31	31.5	.223	83.5	N.	97	1.5	17	8 P				

**Rain or melted snow at base of tower. *Included in following day.

PR 21 1914

REMARKS.

By far the most noticeable feature of the weather during January was the unusually high temperature which prevailed. The mean of means of maximum and minimum temperatures during the month was more than seven degrees higher than the normal, giving a new high record for the month at this station. The maximum and minimum for the month were both more than ten degrees higher than usual, and are the highest reached here since 1890.

The barometer was considerably higher than the normal and the range was about the usual amount.

The mean dew point was about two and one-half degrees above the normal and the relative humidity rather low.

The total precipitation was about sixty per cent of the normal and most of it occurred as rain. The snowfall was very light and soon melted leaving the ground bare most of the month.

The total wind movement was slightly more than the normal; the record by the Draper anemometer being 4659 miles. The wind records on the first and third pages of this bulletin beginning with this month are those given by a new standard electric recording anemometer instead of those of the Draper anemometer heretofore used. For light winds especially the records of the new instrument are considerably greater than those of the old instrument. The maximum velocity of wind computed from the rate for a five minute period is also given so that our records may be compared with those of other stations.

J. E. OSTRANDER. Meteorologist.

C. H. CHADWICK, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 206. FEBRUARY, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.63, 11th, 11 A.
Minimum reduced to freezing, 29.34, 28th, 5 A.
Reduced† maximum reading, 30.95, 11th, 11 A.
Reduced† minimum reading, 29.67, 28th, 5 A.
Mean semi-daily reduced, ... 30.203
Monthly range, ... 1.28

****Air Temperature.*** In Degrees Fahr.

Highest, ... 52.5, 24th, 5 P.
Lowest, ... -5.0, 6th, 7 A.; 11th, 7 A.
Mean hourly, ... 23.8
Mean of means of max. and min., ... 24.1
Mean sensible (wet bulb), ... 20.3
Monthly range, ... 57.5
Highest mean daily, ... 41.0, 21st
Lowest mean daily, ... 4.7, 6th
Mean maximum, ... 36.3
Mean minimum, ... 11.9
Mean daily range, ... 24.4
Greatest daily range, ... 40.5, 17th
Least daily range, ... 6.0, 9th

Humidity.

Mean dew point, ... 15.2
Mean force of vapor, ...134
Mean relative humidity, ... 77.4

Precipitation. In inches.

Total precipitation, ... 2.73
Number of days on which .01 inch or more rain or melted snow fell, ... 6
Total snow in inches, ... 13
Snow on ground at end of month, . . . none

Wind.

Total movement, ... 4565 m.
Greatest daily movement, ... 572 m., 28th
Least daily movement, ... 1 m., 14th
Mean daily movement, ... 163 m.
Mean hourly velocity, ... 6.8 m.
Maximum pressure per square foot, 8.5 lbs.= 41 m. per hour, 27th, 11 P., N.; 28th, 10 A., N.
Maximum velocity for 5 minutes, 34 m. per hour 27th, 11:30 P., N.
Prevailing Direction, West, Northwest.

Summary.

North, Northwest, ... 25 per cent.
North, ... 14 " "
South, ... 14 " "
South, Southeast, ... 11 " "
South, Southwest, ... 11 " "
Northwest, ... 11 " "
Other directions, ... 14 " "

Weather.

Mean cloudiness observed, ... 44 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 113 hrs.=38 per cent.
Number of clear days, ... 12
Number of fair days, ... 9
Number of cloudy days, ... 7

Bright Sunshine.

Number of hours recorded, . . 183 hrs.=62%
Rain, 14th, 20th, 21st, 25th.
Gales, 35 miles or more per hour, 36 m. 6th, N.; 37m. 22d, N.; 41m. 27th, N.; 41m. 28th, N.
Snow, 5th, 9th, 14th, 15th, 18th.
Days of Sleighing, ... 13

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.91	29.68	29.792	43.0	3 P	25.0	7 A	34.0	34.7	29.5	7.5
2	30.28	29.71	30.069	33.0	0 A	3.0	12 P	18.0	13.7	7.5	9.0
3	30.52	30.28	30.470	22.0	3 P	−3.0	7 A	9.5	9 5	4.7	9.0
4	30.43	30.16	30.283	37.5	3 P	14.0	0 A	25.7	28.0	25.3	5.8
5	30.42	30.11	30.238	37.0	1 P	9 0	12 P	23.0	26.7	21.5	0 3
6	30.59	30.42	30.585	13.5	5 P	−5.0	7 A	4.3	4.7	1.3	10.0
7	30.57	30.37	30.490	25.5	5 P	2.0	3 A	13.7	10.8	8.3	6.0
8	30.50	30.39	30.457	29.5	5 P	−1.5	7 A	14.0	14.9	13.7	0.0
9	30.39	29.79	29.987	28.5	12 P	22.5	7 A	25.5	25.2	23.7	0.3
10	30.66	30.05	30.425	33.5	3:30 P	12.0	12 P	22.7	22.9	19.7	8.7
11	30.95	30.66	30.719	33.5	4:30 P	−5.0	7 A	14.3	11.4	4.0	9.5
12	30.92	30.49	30.682	37.0	3 P	1.5	2 A	19.3	18.8	18.3	6.8
13	30.49	29.94	30.147	41.0	5 P	14.5	4 A	27.7	29.0	30.7	5.0
14	29.96	29.84	29.912	41.5	3 P	20.5	7 A	31.0	31.3	29.5	0.0
15	30.31	29.96	30.150	33.5	0 A	5.0	12 P	19.3	16.8	14.5	4.5
16	30.53	30.31	30.478	33.0	4:30 P	−4.5	7 A	14.3	11.3	5.7	10.0
17	30.62	30.45	30.545	42.5	3 P	2.0	7 A	22.3	15.6	10.7	9.5
18	30.45	30.02	30.188	35.0	3:30 P	1.0	7 A	18.0	20.3	18.3	7.0
19	30.26	29.99	30.127	41.0	4 P	23.5	7 A	32.3	32.2	28.7	5.4
20	30.32	30.11	30.247	46.0	4 P	13.0	7 A	29.5	31.0	25.7	8.8
21	30.11	29.69	29.815	45.5	2 P	37.0	12 P	41.3	41.0	40.0	2.5
22	30.26	29.69	30.004	45.0	3:30 P	28.0	12 P	36.5	38.9	34.0	9.8
23	30.41	30.26	30.337	50.0	4 P	23.5	7 A	36.7	33.5	27.5	10.0
24	30.32	30.09	30.204	52.5	5 P	23.0	7 A	37.7	35.5	30.5	9 0
25	30.09	29.75	29.930	45.0	4 P	27.5	7:30 A	36.3	37.5	36.0	6.0
26	29.86	29.68	29.783	43.5	1 P	27.0	12 P	35 5	35.0	30.0	4.0
27	29.90	29.76	29.840	30.0	2:30 P	14.0	12 P	22.0	23.9	19.5	8.2
28	29 90	29.67	29.780	18.5	4 P	6.0	12 P	12.3	12.5	9.0	10.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	24.5	.181	75.0	S.S.W.	152	1.0	14	7 P				
2	1.5	.068	74.5	N.N.W.	380	5.5	33	11 A				
3	-2.5	.061	67.0	S.S.W.	216	1.5	17	1 A				
4	18.5	.156	68.0	S.S.W.	392	5.5	33	1 P				
5	17.0	.132	78 5	N.N.W.	155	4.5	30	6 P	1 P	5 P	.01	½
6	-14.0	.056	46.5	N.	373	6.5	36	8 A				
7	3.0	.070	74.5	N.	213	2.5	22	3 A				
8	9.5	.100	80.5	S.	21	0.0	—	—				
9	22.0	.132	94.0	N.N.W.	231	4.0	28	5 P	0 A	2:30 P	1.41	8
10	18.0	.113	92.0	W.N.W.	161	1.5	17	8 P				
11	-5.5	.059	63.5	N.W.	95	0.0	—	—				
12	16.0	.112	90.5	S.	20	0.0	—	—				
13	28.0	.186	84.0	N.N.W.	114	4.0	28	1 P				
14	26.5	.175	84.0	N.W.	1	0.0	—	—	11 A	12 P	.20	2
15	13.0	.091	92.5	N.N.W.	169	4.5	30	6 P	0 A	12 M	.25	2½
16	3.0	.064	85.5	S.E.	46	0.0	—	—				
17	6.0	.082	77.0	W.	13	0.0	—	—				
18	16.0	.123	87.5	S.	30	0.5	10	1 A	3 P	10 P		T
19	27.5	.171	89.5	N.W.	13	0.0	—	—				
20	22.0	.172	80.5	S.S.E.	72	2.0	20	4 P	10 P	12 P	T	
21	38.5	.256	92.0	S.S.E.	194	2.5	22	2 A	0:30 P	11 P	.44	
22	29.0	.221	73.5	N.	264	7.0	37	11 A				
23	16.5	.181	53.5	N.E.	93	0.0	—	—				
24	25.0	.197	73.0	S.	18	0.0	—	—				
25	29.5	.231	73.5	S.S.E.	43	0.0	—	—	3 P	12 P	.42	
26	26.0	.182	83.5	N.N.W.	165	3.0	24	4 P				
27	12.0	.120	66.5	N.	349	8.5	41	11 P				
28	1.5	.074	66.5	N.N.W.	572	8.5	41	10 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during February proved to be the most seasonable of the winter. A large amount of sunshine and a small precipitation were the most noticeable features although the high mean barometer was probably the most abnormal of the various records.

A comparison of the records with those of previous years, shows the following as the most important features: The mean barometer was almost two-tenths of an inch above the normal and the maximum almost equalled the highest record of this station. The minimum was also very high giving a range considerably less than usual.

The mean temperature was about normal although both the maximum and the minimum were higher than usual. The mean dew point was more than two degrees lower than the average while the relative humidity was normal.

The total precipitation was about eighty per cent of the usual amount and more than half of it occurred during a snow storm which gradually turned to a fine hail, thus giving a large amount of water when melted.

The total wind movement was slightly less than the normal although the daily record for the 28th was one of the largest ever recorded here. The total for the month by the Draper anemometer was 4521 miles, which is but slightly smaller than the amount given by the electric register.

J. E. OSTRANDER, Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 207. MARCH, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.59, 24th, 8 A.
Minimum reduced to freezing,	28.98, 9th, 4 P.
Reduced† maximum reading,	30.92, 24th, 8 A.
Reduced† minimum reading,	29.28, 9th, 4 P.
Mean semi-daily reduced,	30.090
Monthly range,	1.64

****Air Temperature.*** In Degrees Fahr.

Highest,	53.0, 29th, 3 P.
Lowest,	—7.5, 24th, 7 A.
Mean hourly,	28.3
Mean of means of max. and min.,	28.0
Mean sensible (wet bulb),	25.3
Monthly range,	60.5
Highest mean daily,	41.3, 28th
Lowest mean daily,	11.5, 24th
Mean maximum,	37.0
Mean minimum,	18.9
Mean daily range,	18.1
Greatest daily range,	47.5, 25th
Least daily range,	4.5, 30th

Humidity.

Mean dew point,	19.3
Mean force of vapor,	.158
Mean relative humidity,	73.9

Precipitation. In inches.

Total precipitation,	4.90
Number of days on which .01 inch or more rain or melted snow fell,	11
Total snow in inches,	20¾
Snow on ground at end of month,	trace

Wind.

Total movement,	5686 m.
Greatest daily movement,	471 m., 1st
Least daily movement,	18 m., 25th
Mean daily movement,	183 m.
Mean hourly velocity,	7.6 m.

Maximum pressure per square foot, 7.0 lbs.= 37 m. per hour, 10th, 11 A., N.W.

Maximum velocity for 5 minutes, 30 m. per hour 22d, 7 A., N. W.

Prevailing Direction, North, Northwest.

Summary.

North, Northwest,	13 per cent.
North,	13 " "
North, Northeast,	16 " "
Northeast,	10 " "
Northwest,	23 " "
Other directions,	25 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	146 hrs.=39 per cent.
Number of clear days,	11
Number of fair days,	13
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded,	225 hrs.=61%

Rain, 3d, 4th, 26th, 27th, 30th, 31st.

Gales, 35 miles or more per hour, 37 m. 10th, N.W.; 35m. 20th, N.W.; 36m. 22d, N.W.

Snow, 3d, 8th, 12th, 14th, 15th, 19th, 20th, 22d, 31st.

Days of Sleighing,	13

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30 09	29.90	29.976	29.0	4 P	6.0	1 A	17.5	19.0	17.0	10.3
2	30.36	30.09	30.306	35.0	4 P	18.0	6:30 A	26.5	26.1	22.0	7.0
3	30.36	29.66	30.115	34.5	8 P	21.0	5:30 A	27.7	28.2	28.7	0.0
4	29.83	29.53	29.679	44.5	2 P	32.5	7 A	38.5	36.5	33.5	2.2
5	30.42	29.83	30.175	37.5	5 P	22 0	12 P	29.7	32.9	28.5	7 4
6	30 68	30 46	30.580	40.0	4:30 P	16.5	7 A	28.3	27.8	22.7	10 5
7	30.46	29.98	30.137	37.0	4 P	23.0	6 A	30.0	31.0	31.7	0.7
8	29 98	29.70	29.836	50.0	4 P	30 0	7:30 A	40.0	38.1	33.7	9.0
9	29 70	29.28	29.404	43.0	5 P	32.0	7 A	37.5	37.2	34.3	0.0
10	29.84	29.35	29.578	44.5	12 M	30.0	12 P	37.3	35.3	30.0	5.0
11	30 06	29 84	30.032	40 0	3:30 P	26.5	6 A	33.3	33 7	29.5	9.0
12	30.34	29 89	30.130	36.0	2 P	24.0	12 P	30.0	31.1	27.3	8.7
13	30.43	30.22	30.333	30.0	3:30 P	17.0	7:30 A	23.5	23.0	18.5	8.6
14	30.29	30.20	30 264	30.0	3 P	17.0	6:30 A	23 5	23 0	19.3	10 0
15	30 28	29 72	30.041	20.0	3 P	15 0	6 A	17.5	17.8	15.7	0.0
16	29.86	29.67	29.812	40.0	3 P	15.0	6:30 A	27.5	26.5	23.0	10 0
17	30.26	29 86	30.079	30 0	3 P	12.0	6:30 A	21.0	22.3	19 3	11.0
18	30.55	30.26	30.516	33.0	5 P	6 5	6:30 A	19.7	21.7	18.5	11.5
19	30 55	29.61	30.220	30.0	1 P	9.5	6 A	19.7	21.3	20.3	5.7
20	29 67	29.34	29 470	34.0	3 P	25.0	7 A	29.5	27.6	26.0	8.2
21	29.90	29.67	29.882	33.5	2 P	15.0	6:30 A	24.3	27.5	23.0	10.5
22	30.33	29.70	30.002	30.0	1 P	15.0	12 P	22.5	25.0	22.0	9 5
23	30.79	30.33	30.627	21.0	4 P	4.0	12 P	12.5	13.0	8.7	11.5
24	30.92	30.83	30 874	32.0	5 P	−7 5	7 A	12.3	11.5	11.3	11.5
25	30.83	30.67	30.756	44.5	2 P	−3 0	6:30 A	20 7	21.5	16.7	12.0
26	30.67	30.14	30 446	36.0	3 P	7.0	7 A	21.5	24.9	23.5	6.0
27	30.14	29.71	29 813	45.0	4 P	34.0	0 A	39.5	40.7	41.5	1.0
28	30.17	29 72	30.059	52.0	5:30 P	32.0	12 P	42 0	41.3	36.5	11.8
29	30 26	30.13	30.193	53 0	3 P	25.0	6 A	39 0	38.2	32.7	8 8
30	30.13	29.57	29.835	41 5	2 P	36 0	7 A	38.7	38.1	37.3	0 0
31	29.71	29.49	29.612	41.5	1:30 P	31.0	12 P	36.3	35.4	31.7	8.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	9 5	.108	67.5	N.N.W.	471	5.5	33	11 A				
2	13.0	.142	58.5	N.N.E.	286	1.5	17	0 A				
3	23.5	.173	77.5	N.E.	32	0.0	—	—	10 A	12 P	*	½
4	31.0	.200	88.5	N.W.	158	2.5	22	2 P	0 A	8 A	2.00	
5	22.5	.178	69 5	N.	285	4.5	30	11 A				
6	13 0	.147	56.5	S.S.W.	136	1.0	14	9 P				
7	30.0	.185	92.5	S.S.W.	55	0.5	10	5 P				
8	30.5	.208	83.5	N.	62	0.0	—	—	11 A	12 P		T
9	25.0	.216	77.0	N.	210	3 5	26	12 M				
10	22.0	.196	62.0	N.W.	428	7.0	37	11 A				
11	22.0	.191	63.5	N.W.	363	2.0	20	12 M				
12	22 0	.166	74.0	N.N.W.	200	5.5	33	1 P	1 A	5 A	.22	1¼
13	8 5	.118	56.5	W.N.W.	117	1.0	14	4 A				
14	9.5	.122	59.5	N.N.E.	49	1.0	14	6 P	2 A	4 A		T
15	9.5	.100	71.0	N.N.E.	107	4.0	28	11 A	8 A	12 P	1.11	10
16	19.5	.132	81.0	N.N.E.	198	1.0	14	2 P				
17	8.0	.125	52.5	N.N.W.	218	5.0	32	3 P				
18	9 5	.118	59.0	N.W.	133	2.5	22	11 A				
19	15.5	.118	79.0	N.	53	1.5	17	9 P	12 M	12 P	*	*
20	23 0	.147	88.0	N.W.	280	6.0	35	4 P	0 A	12 M	.98	8
21	18.5	.151	76.0	S.W.	278	2.5	22	1 A				
22	18 0	.128	82.5	N.W.	376	6.5	36	8 A	7 A	8 A	.03	½
23	1.0	.073	66.5	N.W.	232	2.0	20	3 P				
24	4.5	.082	70.5	N.N.W.	64	0.0	—	—				
25	4 0	.111	55.5	W.N.W.	18	0.0	—	—				
26	22.5	.138	96.5	S.	27	0.0	—	—	5 P	12 P	.04	
27	41 0	.263	98.0	S.W.	270	3 0	24	7 A	0 A	12 P	.12	
28	30 0	.244	69.5	N.E.	179	3.0	24	8 A				
29	29.0	.208	80.5	N.E.	20	0.0	—	—				
30	36.5	.226	95 5	S.E.	42	0.0	—	—	9 A	12 P	.25	
31	27.5	.191	83.5	N.N.E.	339	3.0	24	4 P	0 A	9 A	.15	T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during March was more wintry than that of January, and in some respects more than February as well. The greatest snowstorm, the largest monthly snowfall and the lowest temperature of the winter were all noted this month. The progress of the season was slow and the month closed with the season somewhat backward.

Some of the more important features of the weather elements were as follows: The mean barometer was considerably higher than the normal and the maximum was the highest March record at this station excepting that of 1904. The fluctuations of pressure were large and extended over periods of several days. The total wind movement by the Draper anemometer was 5105 miles which is slightly less than the March mean. The large amount of wind from the northwest quadrant was especially noticeable.

The mean temperature was nearly six degrees below the normal. The minimum temperature was thirteen degrees below the average March minimum and the lowest for this month on the records of this station. The maximum record was also unusually low. The mean dew point was seven degrees lower than usual while the relative humidity was practically normal.

The total precipitation was about twenty per cent more than the normal and well distributed throughout the month. Nearly one-half the amount occurred as snow. The heaviest snowstorm of the season occurred on the 15th and a second large storm on the 20th furnished the best sleighing of the winter.

A large amount of sunshine was noted and the number of cloudy days was comparatively small.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 208. APRIL, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.14, 3d, 9 A.
Minimum reduced to freezing,	29.10, 25th, 12 M.
Reduced† maximum reading,	30.45, 3d, 9 A.
Reduced† minimum reading,	29.40, 25th, 12 M.
Mean semi-daily reduced,	29.981
Monthly range,	1.05

****Air Temperature.*** In Degrees Fahr.

Highest,	74.5, 19th, 3 P., 20th, 4 P.
Lowest,	21.0, 3d, 6 A.
Mean hourly,	45.1
Mean of means of max. and min.,	45.9
Mean sensible (wet bulb),	40.2
Monthly range,	53.5
Highest mean daily,	55.8, 19th
Lowest mean daily,	32.9, 2d
Mean maximum,	58.3
Mean minimum,	33.6
Mean daily range,	24.7
Greatest daily range,	42.0, 29th
Least daily range,	9.5, 15th, 23d

Humidity.

Mean dew point,	34.7
Mean force of vapor,	.301
Mean relative humidity,	70.3

Precipitation. In inches.

Total precipitation,	3.25
Number of days on which .01 inch or more rain or melted snow fell,	10
Total snow in inches,	2

Wind.

Total movement,	4777 m.
Greatest daily movement,	436 m., 24th
Least daily movement,	36 m., 19th
Mean daily movement,	159 m.
Mean hourly velocity,	6.6 m.

Maximum pressure per square foot, 10.0 lbs.= 45 m. per hour, 24th, 1 P., N.N.W.

Maximum velocity for 5 minutes, 36 m. per hour 24th, 2 P., N.N.W.

Prevailing Direction, North.

Summary.

North, Northeast,	33 per cent.
North,	20 " "
South,	10 " "
Southwest,	10 " "
Other directions,	27 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	133 hrs.=34 per cent.
Number of clear days,	13
Number of fair days,	13
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 269 hrs.=66%

Rain, 4th, 5th, 6th, 8th, 9th, 10th, 14th, 15th. 20th, 23d, 30th.

Gales, 35 miles or more per hour, 45 m. 24th, N.N.W.; 35m. 28th, N.

Snow, 8th, 9th, 23d.

Thunder and Lightning, 30th.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.99	29.71	29.850	45.0	4:30 P	25.0	6 A	35.0	34.1	28.5	12.0
2	30.34	29.99	30.215	45.0	4 P	23.0	3 A	34.0	32.9	27.5	12.0
3	30.45	30.28	30.371	57.0	5 P	21.0	6 A	39.0	39.0	34.5	12.0
4	30.28	29.78	29.975	65.0	3 P	25.5	6:30 A	45.3	46.3	42.0	9.3
5	29.88	29.65	29.805	53.0	3 P	36 0	6:30 A	44.5	45.1	41.0	9.2
6	29.91	29.51	29.716	48.0	1 P	35.0	12 P	41.5	40.4	37.3	6.8
7	30.08	29.91	30.052	49.0	5 P	26.5	6:30 A	37.7	38.1	32.7	11.0
8	30.42	30.08	30.315	52.5	4 P	30 0	6:30 A	41.3	39.2	32.7	8.0
9	30 44	30.17	30.364	46.0	10:30 A	29.0	7 A	37.5	35.5	32.7	4.5
10	30.17	29.88	29.916	50.0	4 P	32.0	7 A	41.0	39.0	37.5	7.4
11	30.01	29.91	29.958	53.0	5 P	34.5	6 A	43.7	43.2	40.0	8.9
12	30.25	30.01	30.124	53.0	1:30 P	38.0	6 A	45.5	44.2	39.7	8.2
13	30.37	30.24	30.311	62.0	5 P	30.0	5:30 A	46.0	45.5	39.7	12.0
14	30.33	30.03	30.186	54.0	2 P	30.0	6 A	42.0	45.7	45.0	5.2
15	30.03	29.84	29.941	55.5	5 P	46 0	12 P	50.7	51.8	49.5	0.8
16	30.24	30.01	30.182	62.0	3 P	39.0	12 P	51.0	49.8	42.0	11.5
17	30.27	30.14	30.235	66.0	5:30 P	30.0	6 A	48.0	49.0	42.3	12.5
18	30.27	30.14	30.214	71.0	4 P	33 5	6 A	52.3	53.9	46 0	12.5
19	30.19	30.05	30.132	74.5	3 P	40.0	3 A	57.3	55.8	48.0	9.5
20	30.10	29.84	29.940	74.5	4 P	45.5	6 A	60.0	53.6	48.7	5.8
21	29.85	29.63	29.710	73.5	3 P	39.5	6 A	56.5	52.3	45.7	12.0
22	29.74	29.65	29.732	63.0	5 P	40.0	12 P	51.5	51.3	43.5	11.5
23	29.72	29.63	29 687	44 5	5:30 P	35.0	2 P	39.7	37.9	35.5	0.5
24	29.63	29.43	29.538	53.0	4 P	35.0	7 A	44.0	43.6	35.5	10.0
25	29.57	29 40	29.506	50 5	0:30 P	35.0	3 A	42.7	40.6	35.3	7.3
26	29.69	29.56	29 650	64.0	4:30 P	28.5	3 A	46.3	45.5	40.0	9.5
27	29.73	29 60	29.673	66.0	3:30 P	33.0	5:30 A	48.5	49.8	46.7	12.5
28	30.08	29 73	29.984	60.5	5 P	35.5	5:30 A	48 0	45.1	42.5	12.0
29	30.18	30.05	30.128	73.0	4 P	31.0	6 A	52.0	52.4	45.0	12.5
30	30.10	29.88	30.021	65.0	3:30 P	47.0	5:30 A	56.0	53.6	50.7	2.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	18 5	.188	54.5	N.	292	5.5	33	11 A				
2	13.5	.192	44.0	N.N.E.	237	4.5	30	4 P				
3	30.0	.226	74.0	N.N.E.	84	3.5	26	11 A				
4	39.5	.302	85.0	W.	105	3.0	24	5 P	6 P	9 P	.02	
5	36.5	.290	76 5	N.	158	1.0	14	1 P	11 P	12 P	.02	
6	33.5	.245	79.5	N.	252	4.0	28	11 A	0 A	3 P	.40	
7	25.5	.222	63.0	N.	123	1.0	14	1 P				
8	25.5	.218	65.0	N.N.E.	116	1.0	14	5 P	2 A	6 A	.04	T
9	29.0	.171	83.5	S.	125	2.0	20	3 P	2 P	12 P	.25	2
10	37.0	.228	96.0	N.N.E.	173	3.5	26	1 A	0 A	12 P	1.21	
11	37.0	.272	80.5	N.E.	137	1.0	14	5 P				
12	35.0	.279	73.5	N.N.E.	242	2.5	26	2 P				
13	31.0	.310	57.0	S.W.	94	1.0	14	8 P				
14	42.0	.329	84.0	S.S.W.	269	5.0	32	11 P	10 P	12 P	.01	
15	48.0	.375	90.0	S.W.	347	5.5	33	3 P	0 A	3 P	.68	
16	35.0	.327	62.5	N.N.E.	121	3.5	26	6 P				
17	36.0	.338	64.5	N.N.E.	64	1.5	17	4 P				
18	37.5	4.15	56.5	N.N:E.	99	3.5	26	3 P				
19	42.5	.410	69.0	N.N.E.	36	1.0	14	11 P				
20	43.5	.433	67.0	S.S.W.	67	0.5	10	3 A	9 A		T.	
21	41.5	.365	73.0	S.W.	54	2.5	22	2 P				
22	35.5	.358	59.0	N.	121	3.0	24	8 A				
23	34.5	.224	83.5	N.N.E.	229	5.0	32	12 M	7 A	4 P	.14	T
24	25.0	.266	52.0	N.N.W.	436	10.0	45	1 P				
25	27.0	.248	60.0	N.N.W.	209	4.0	28	5 P				
26	34.0	.298	64.5	N.E.	65	3.5	26	2 P				
27	42.5	.386	73.5	W.N.W.	119	4.5	30	4 P				
28	37.5	.314	73.0	N.	152	6.0	35	4 P				
29	39.5	.397	62.5	S.	78	2.5	22	5 P				
30	48.0	.418	82.0	S.	172	2.5	22	7 P	2 A	5 P	.48	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during April was pleasant and seasonable. The departures from the normals of the several weather elements were small and unimportant. The large amount of wind from the North was an unusual feature. The small number of days classed as cloudy was exceptional for the season.

A comparison of the records with those of previous years shows the following features: The mean barometer was practically normal and the range about the usual amount. Large fluctuations were wanting. The high wind of the 24th was accompanied by but little change in the pressure at this station.

The mean temperature was practically normal while the maximum was about five degrees lower than usual. The mean dew-point was practically normal while the relative humidity was rather high.

The total precipitation was slightly more than the average and most of it occurred before the middle of the month. The snow and rain storm of the 9th-10th was the heaviest of the month.

The total wind movement was about ten per cent less than usual, the Draper record being 4463 miles.

The month closed with the roads in good condition and the season about normal.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 209. MAY, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.19, 15th, 8 A.
Minimum reduced to freezing,	29.11, 3d, 4 A.
Reduced† maximum reading,	30.49, 15th, 8 A.
Reduced† minimum reading,	29.41, 3d, 4 A.
Mean semi-daily reduced,	29.962
Monthly range,	1.08

****Air Temperature.*** In Degrees Fahr.

Highest,	90.0, 18th, 3 P.
Lowest,	31.5, 4th, 6 A. 11th, 5 A.
Mean hourly,	56.7
Mean of means of max. and min.,	56.9
Mean sensible (wet bulb),	51.3
Monthly range,	58.5
Highest mean daily,	74.8, 18th
Lowest mean daily,	42.0, 10th
Mean maximum,	69.5
Mean minimum,	44.4
Mean daily range,	25.1
Greatest daily range,	41.5, 16th
Least daily range,	3.0, 28th

Humidity.

Mean dew point,	46.4
Mean force of vapor,	.478
Mean relative humidity,	70.9

Precipitation. In inches.

Total precipitation,	4.95
Number of days on which .01 inch or more rain or melted snow fell,	12

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3766 m.
Greatest daily movement,	320 m., 13th
Least daily movement,	1 m., 6th
Mean daily movement,	121 m.
Mean hourly velocity,	5 m.

Maximum pressure per square foot, 7.5 lbs.= 39 m. per hour, 29th, 10 A., N.N.W.

Maximum velocity for 5 minutes, 30 m. per hour 3d, 10 A., E.N.E.

Prevailing Direction, West, Southwest.

Summary.

South, Southeast,	23 per cent.
West,	13 " "
West, Northwest,	13 " "
Northwest,	13 " "
North, Northwest,	10 " "
Other directions,	28 " "

Weather.

Mean cloudiness observed,	47 per cent.
Total cloudiness recorded by the Sun Thermometer,	165 hrs.=36 per cent.
Number of clear days,	14
Number of fair days,	12
Number of cloudy days,	5

Bright Sunshine.

Number of hours recorded, . . 288 hrs.=64%

Rain, 2d, 3d, 5th, 6th, 7th, 9th, 17th, 19th, 24th, 25d, 27th, 28th, 29th.

Gales, 35 miles or more per hour, 35 m. 3d, E.; 35m. 19th, W.N.W.; 36 m. 20th, N.: 39 m. 29th, N.N.W.

Hail, 2d.

Thunder and Lightning, 17th, 18th, 19th, 24th, 25th.

Frosts, 4th, 11th, 15th, 21st, 20th.

Killing Frost, 11th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.91	29.965	68.0	5 P	45.0	5:30 A	56.5	55.8	49.0	11.5
2	30.01	29.50	29.722	63.0	3 P	39.5	4 A	51.3	51.5	46.3	5.6
3	29.80	29.41	29.597	62.5	9:30 A	40.0	12 P	51.3	53.3	49.7	6.6
4	29.87	29.70	29.801	67.0	3 P	31.5	6 A	49.3	50.9	48.0	12.5
5	29.80	29.69	29.751	65.0	4 P	50.0	3 A	57.5	56.0	54.0	4.0
6	29.83	29.78	29.800	55.5	1 P	49.0	12 P	52.3	52.8	51.0	0.9
7	29.97	29.83	29.910	61.5	3 P	45.0	7 A	53.3	51.8	44.7	7.8
8	30.16	29.97	30.139	57.5	5:30 P	42.5	6 A	50.0	45.2	43.0	12.8
9	30.15	29.91	29.965	49.0	8 A	40.0	12 P	44.5	44.0	43.5	0.0
10	30.06	29.86	29.929	49.0	3 P	33.5	5 A	41.3	42.0	38.5	6.0
11	30.23	30.06	30.174	57.0	5 P	31.5	5 A	44.3	44.6	40.5	13.0
12	30.28	29.95	30.126	68.5	1:30 P	37.0	5 A	52.7	54.0	49.3	8.2
13	30.10	29.94	30.008	79.0	10 A	56.5	2:30 A	67.7	66.7	62.7	9.1
14	30.40	30.10	30.289	73.0	3 P	52.0	7 A	62.5	60.2	47.0	10.4
15	30.49	30.27	30.406	71.0	3 P	33 0	6 A	52.0	53.6	47.0	13.5
16	30.27	30.01	30.105	87.5	4 P	46.0	5 A	66.7	67.4	60.3	13.0
17	30.10	29.88	30.009	86.0	1 P	52.0	5:30 A	69.0	67.5	62.0	9.5
18	29.89	29.70	29.783	90.0	3 P	58.5	4 A	74.3	74.8	67.3	13.2
19	29.77	29.58	29.698	85.0	3 P	55.0	12 P	70.0	70.0	58.7	12.2
20	30.10	29.77	29.972	65.0	2 P	41.0	12 P	53.0	54.2	43.7	13.5
21	30.28	30.10	30.231	66.5	5 P	32.5	5 A	49.5	50.3	45.5	13.3
22	30.33	30.22	30.300	70.5	4 P	42.5	4 A	56.5	55.8	47.7	13.2
23	30.26	30.08	30.153	80.5	2 P	42.5	5:30 A	61.5	62.2	54.3	12.0
24	30.08	29.93	30.027	85 0	2 P	51.0	5:30 A	68.0	66.8	61.0	10.0
25	29.98	29.81	29.883	83.0	4 P	57.0	3 A	70.0	66.8	62.7	8.5
26	29.88	29.71	29.784	83.0	12:30 P	52.0	4:30 A	67.5	67.0	61.0	10.1
27	29.76	29.68	29.700	69.0	11 A	48.0	12 P	58.5	56.8	57.3	0.5
28	29.75	29.67	29.724	49.0	4 P	46.0	12 P	47.5	47.5	45.5	0.0
29	29.97	29.73	29.878	64.5	4 P	42.0	12 P	53.3	51.8	46.0	11.6
30	30.05	29.97	30.024	68.5	4 P	35.5	5 A	52.0	54.0	49.5	13.0
31	30.02	29.89	29.966	74.5	3:30 P	48.0	4 A	61.3	61.3	54.5	12.1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	42.5	.442	62.5	W.N.W.	141	4.0	28	9 A				
2	37.5	.385	65.5	S.	77	3.5	26	4 P	2 P	9 P	.15	
3	55.5	.413	76.5	E.N.E.	155	6.0	35	9 A	7 A		T.	
4	46.0	.372	85.0	S.E.	185	5.0	32					
5	52.5	.460	84 0	W.	93	0.5	10	5 P	9 A	10 P	.01	
6	48.0	.412	83.5	S.	1	0.0	—	—	9 A	12 P	.06	
7	40.0	.346	74.5	W.	65	1.5	17	6 P	0 A	8 A	.29	
8	37.0	.328	69.0	W.N.W.	161	3.5	26	3 P				
9	41.0	.313	82.5	S.W.	104	2.0	20	2 P	7 A	11 P	.56	
10	30.0	.281	63.5	S.S.W.	189	4.5	30	3 P				
11	32.5	.314	58.5	W:N.W.	112	2.5	22	11 A				
12	44.5	.432	69.5	S.E.	208	4.5	30	12 M				
13	58.5	.740	68.0	W.	320	5.0	32	3 P				
14	37.5	.427	56.0	N.W.	124	2.5	22	6 P				
15	38.5	.424	56.5	S.S.E.	133	4.0	28	6 P				
16	55.0	.722	64.5	W.	66	1.5	17	4 P				
17	58.5	.652	77.0	S.S.E.	70	4.0	28	5 P	1 P	8 P	.25	
18	61.5	.932	61.0	S.W.	61	2.5	22	3 P				
19	52.5	.658	62.5	W.N.W.	163	6.0	35	3 P	0 A	1 A	.01	
20	35.5	.370	56.5	N.N.W.	218	6.5	36	3 P				
21	38.5	.384	61.5	S.S.E.	13	3.0	24	7 P				
22	39.5	.430	59.5	S.S.E.	162	4.0	28	5 P				
23	48.0	.556	62.0	S.S.E.	27	0.5	10	4 P				
24	58.0	.613	81.0	N.W.	9	4.0	28	5 P	5 P	8 P	.17	
25	61.5	.613	89.5	N.E.	22	3.5	26	5 P	7 A	7 P	.01	
26	53.0	.632	77.5	S·S.E.	181	5.0	32	4 P				
27	56.0	.503	94.0	N.W.	140	3.0	24	1 P	7 A	12 P	1.57	
28	43.5	.322	89.5	N.N.W.	158	3.5	26	2 P	0 A	12 P	1.63	
29	42.5	.350	78.5	N.N.W.	290	7.5	39	10 A	0 A	6 A	.24	
30	43.0	.467	61.5	N.W.	70	1.5	17	11 A				
31	50.0	.528	68.0	S.S.E.	48	1.5	17	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during May was generally seasonable and was marked by no unusual features of especial interest. A few unusually warm days near the middle of the month and a couple of cool days near the close of the month were perhaps the most noticeable features.

A comparison of the records with those of previous years shows the following characteristics of the several weather elements. The mean barometer was normal and the range was considerably more than usual. The fluctuations in pressure were generally slow and unimportant.

The mean temperature was slightly lower than usual and the maximum and minimum were both above the average records. The maximum record was made considerably earlier than usual in the month. Several frosts were noted but the only one causing damage occurred on the 11th, too early in the month to cause great damage.

The mean dew point was slightly lower and the relative humidity considerably higher than usual.

The total precipitation was about forty per cent. more than normal. About two-thirds of it occurred during the heavy storm of the 27th-29th.

The total wind movement was considerably less than usual although a number of light gales occurred.

The number of hours of bright sunshine was large and but few cloudy days were noted.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 210. JUNE, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.06, 13th, 8 A.
Minimum reduced to freezing, 29.30, 10th, 3 P.
Reduced† maximum reading, 30.35, 13th, 8 A.
Reduced† minimum reading, 29.58, 10th, 3 P.
Mean semi-daily reduced, ... 29.935
Monthly range, ... 0.77

****Air Temperature.*** In Degrees Fahr.

Highest, ... 87.5, 28th, 3 P.
Lowest, ... 37.0, 12th, 5:30 A.
Mean hourly, ... 66.1
Mean of means of max. and min., ... 66.1
Mean sensible (wet bulb), ... 61.3
Monthly range, ... 50.5
Highest mean daily, ... 74.8, 29th
Lowest mean daily, ... 55.2, 12th
Mean maximum, ... 78.1
Mean minimum, ... 54.2
Mean daily range, ... 23.9
Greatest daily range, ... 38.5, 14th
Least daily range, ... 6.5, 17th, 18th

Humidity.

Mean dew point, ... 58.3
Mean force of vapor, ... 64.0
Mean relative humidity, ... 79.1

Precipitation. In inches.

Total precipitation, ... 2.82
Number of days on which .01 inch or more rain or melted snow fell, ... 11

Wind.

Total movement, ... 1409 m.
Greatest daily movement, ... 121 m., 11th
Least daily movement, ... 3 m., 16th
Mean daily movement, ... 47 m.
Mean hourly velocity, ... 2 m.
Maximum pressure per square foot, 5.0 lbs.= 32 m. per hour, 6th, 4 P., N.W.; 30th, 3 P., N.N.E.
Maximum velocity for 5 minutes, 20 m. per hour 30th, 3 P., N.N.E.
Prevailing Direction, West, Northwest.

Summary.

South, Southeast, ... 17 per cent.
South, ... 10 " "
Northwest, ... 23 " "
Other directions, ... 50 " "

Weather.

Mean cloudiness observed, ... 54 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 141 hrs.=31 per cent.
Number of clear days, ... 11
Number of fair days, ... 16
Number of cloudy days, ... 3

Bright Sunshine.

Number of hours recorded. . . 316 hrs.=69%

Rain, 2d, 5th, 6th, 8th, 9th, 10th, 16th, 17th, 18th, 23d, 29th, 30th.

Gales, 35 miles or more per hour, none.

Thunder and Lightning. 5th, 6th, 9th, 10th, 15th, 22d, 23d, 28th.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.00	29.77	29.903	83.5	2:30 P	49.5	5:30 A	66.5	67.5	62.3	10.7
2	29.93	29.83	29.885	83.5	2:30 P	62.0	4:30 A	72.7	71.1	67.3	10.6
3	30.14	29.93	30.050	79.0	2:30 P	53.0	5 A	66.0	65.8	61.7	14.0
4	30.20	30.06	30.118	81.0	3 P	48.0	5 A	64.5	66.5	59.5	13.8
5	30.06	29.83	29.940	84.5	3:30 P	58.5	3 A	71.5	69.9	64.3	9.4
6	29.83	29.61	29.694	83.0	3 P	65.0	5 A	74.0	70.9	67.3	10.0
7	30.06	29.72	29.900	68.0	2 P	57.0	12 P	62.5	62.9	57.7	10.2
8	30.10	29.96	30.026	67.0	3 P	54.0	3 A	60.5	60.1	57.0	7.2
9	29.98	29.73	29.833	84.0	2:30 P	59.0	3 A	71.5	68.0	67.7	9 0
10	29.77	29.58	29.711	85.0	3 P	60.0	12 P	72.5	69.1	64.5	11.0
11	30.11	29.67	23.971	68.5	3 P	46.5	12 P	57.5	60.2	52.3	14.0
12	30.28	30.11	30.208	59.5	4 P	37.0	5:30 A	48.3	55.2	49.5	14.0
13	30.35	30.20	30.272	76.5	5 P	41.0	4 A	58.7	60.9	54.7	13.8
14	30.21	29.92	30.046	83.5	3 P	45.0	5 A	64.3	66.2	58.5	14.2
15	30.00	29.90	29.942	86.0	0:30 P	50.0	4 A	68.0	67.7	60.7	13.2
16	30.02	29.92	29.980	62.5	10:30 A	53.0	5 A	57.7	58.5	58.0	2.5
17	30.00	29.89	29.942	66.0	4 P	59.5	5 A	62.7	61.5	60.5	2.5
18	30.03	29.96	30.008	63.5	3 P	57 0	12 P	60.3	59.3	56.7	1.5
19	29.96	29.88	29.904	74.5	1:30 P	56.0	4 A	65.3	64.0	62.3	10.6
20	29.98	29.90	29.943	83.0	3:30 P	51.5	4 A	67.3	66.5	60.0	12.2
21	29.98	29.81	29.895	82.0	2:30 P	53.0	5 A	67.5	69.0	61.3	11.5
22	29.83	29.87	29.749	83.5	3:30 P	60.0	12 P	71.7	70.9	64.7	11.6
23	29.91	29.78	29.823	77.0	3:30 P	54.5	12 P	65.7	64.0	61.0	7.8
24	29.97	29.88	29.938	76.5	5 P	52.0	4 A	64.3	63.7	58.7	11.0
25	29.99	29.92	29.961	76.0	2 P	53.0	5 A	64.5	65.5	61.0	11.4
26	30.03	29.86	29.946	83.0	6 P	49.5	5 A	66.3	68.3	63.0	12.2
27	29.97	29.89	29.944	84.0	3:30 P	56.5	5 A	70.3	71.9	65.5	14.0
28	30.03	29.91	29.992	87.5	3 P	57.5	5 A	72.5	73.7	67.7	13.3
29	29.91	29.73	29.776	86.0	2:30 P	66.5	4 A	76 3	74.8	67.5	11.4
30	29.80	29.69	29.765	84.5	1 P	59.5	4 A	72.0	69.4	65.7	7.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	61.0	.618	89.0	S.S.E.	131	3.0	24	1 P				
2	65.0	.770	82.0	S.S.E.	44	2.5	22	6 P	7 P	10 P	.03	
3	59.5	.606	86.0	N.W.	80	2.5	22	10 A				
4	54.0	.658	66.0	S.W.	39	1.0	14	3 P				
5	61.5	.687	81 5	S.	99	3.5	26	7 P	5 P	12 P	.27	
6	65.5	.616	86.0	W.	20	5.0	32	4 P	0 A	4 P	.05	
7	55.5	.545	83.0	E.N.E.	22	0.5	10	6 A				
8	55.0	.505	87.5	S.E.	79	1.5	17	5 P	6 A	8 A	.03	
9	66.5	.728	93.0	S·S.E.	66	4.0	28	5 P	8 P	10 P	.12	
10	62.5	.680	85.5	S.	89	4.5	30	4 P	4 P	6 P	.23	
11	46.5	.499	64.5	N.N.W.	121	3.0	24	7 A				
12	44 5	.439	67.5	N.W.	68	1.0	14	4 P				
13	50.0	.538	67.5	E.	9	0.0	—	—				
14	52.0	.667	60.5	S.W.	48	1.5	17	2 P				
15	57.0	.651	71.5	E.N.E.	28	1.0	14	6 P				
16	56.5	.518	89.0	N.E.	3	0.5	10	12 M	10 A	12 P	.39	
17	59.5	.559	90.5	N.N.E.	7	1.0	14	2 A	0 A	12 P	.91	
18	56.0	.480	93.0	N.	41	1.0	14	12 M	0 A	11 P	.08	
19	51.0	.604	90.0	N.N.E.	37	0.5	10	8 A				
20	56 5	.650	77.0	S.S.E.	6	0.5	10	8 P				
21	56.5	.692	67.5	S.	69	2.5	22	2 P				
22	62.0	.715	78.5	S.S.E.	61	1.0	14	4 P				
23	59.0	.598	83.5	S.E.	75	4.0	28	3 P	5 A	12 P	.55	
24	56.5	.570	80.5	W.	25	2.5	22	6 P				
25	57.0	.668	70.5	N.W.	17	0.5	10	12 M				
26	60.0	.683	77.0	N.W.	10	0.0	—	—				
27	61.5	.780	71.0	N.N.W.	14	0.5	10	3 P				
28	64 5	.836	73.5	N.W.	7	0.0	—	—				
29	64.0	.815	75.5	N.W.	49	3.0	24	2 P	4 A	6:30 A	T	
30	64.0	.721	84.0	N.W.	63	5.0	32	3 P	5 A	12 P	.16	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during June was seasonable and no characteristics of especial interest were manifest.

The mean barometer was a little lower than usual while the maximum and minimum were both normal. From the 4th to the 14th the change in pressure was a little more marked than during the other parts of the month. The wind was more variable than usual, only a few points of the compass having as much as ten per cent of the total for the month. The total wind movement by the electric register was unusually small. This record however was less than it should be owing to friction in the anemometer which was not eliminated until about the close of the month. The record by the Draper anemometer was 2387 miles. The Draper record for May which was not given on the May bulletin was 4451 miles. No gales were noted during the month.

The mean temperature was practically normal although both the maximum and minimum for the month were a few degrees lower than usual. Frost was reported in places on the morning of the 12th, although none was noted near the station.

The mean dew point was slightly higher than usual and the relative humidity about seven per cent more than normal.

The total precipitation was about seventy per cent of the normal and fairly well distributed. Only three cloudy days were noted.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 211. JULY, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.17, 6th, 8 A.
Minimum reduced to freezing,	29.28, 30th, 3 P.
Reduced† maximum reading,	30.46, 6th, 8 A.
Reduced† minimum reading,	29.56, 30th, 3 P.
Mean semi-daily reduced,	29.980
Monthly range,	0.90

****Air Temperature.*** In Degrees Fahr.

Highest,	88.5, 17th, 2:30 P.
Lowest,	45.0, 7th, 5 A.
Mean hourly,	70.1
Mean of means of max. and min.,	71.1
Mean sensible (wet bulb),	65.4
Monthly range,	43.5
Highest mean daily,	76.4, 22nd
Lowest mean daily,	63.5, 7th
Mean maximum,	81.8
Mean minimum,	60.3
Mean daily range,	21.5
Greatest daily range,	33.0, 7th
Least daily range,	9.5, 21st, 25th

Humidity.

Mean dew point,	63.1
Mean force of vapor,	.715
Mean relative humidity,	82.4

Precipitation. In inches.

Total precipitation,	3.45
Number of days on which .01 inch or more rain or melted snow fell,	12

Wind.

Total movement,	3773 m.
Greatest daily movement,	343 m., 30th
Least daily movement,	37 m., 14th
Mean daily movement,	122 m.
Mean hourly velocity,	5.1 m.

Maximum pressure per square foot, 6.5 lbs.= 36 m. per hour, 4th, 12 M., S.W.

Maximum velocity for 5 minutes, 30 m. per hour 17th, 3:30 P., S.W.

Prevailing Direction, South, Southeast.

Summary.

South,	26 per cent.
South, Southeast,	16 " "
Southeast,	13 " "
Northwest,	10 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	53 per cent.
Total cloudiness recorded by the Sun Thermometer,	184 hrs.=40 per cent.
Number of clear days,	5
Number of fair days,	21
Number of cloudy days,	5

Bright Sunshine.

Number of hours recorded, 278 hrs.=60%

Rain, 1st, 2d, 3d, 4th, 9th, 10th, 15th, 17th, 18th, 20th, 21st, 23rd, 24th, 26th, 28th, 29th, 30th, 31st.

Gales, 35 miles or more per hour, 36 m, 4th, S.W; 35 m, 17th, S.W.

Thunder and Lightning, 10th, 17th, 18th, 20th, 21st, 28th, 29th, 31st.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.89	29.73	29.867	78.0	4 P	53.0	5 A	65.5	64.7	59.3	8.8
2	29.89	29.79	29.849	74.5	5 P	61.0	5 A	67.7	67.9	65.7	5.5
3	29.89	29.80	29.863	84.5	2 P	64.5	4 A	74.5	72.5	68.7	8.7
4	30.06	29.66	29.767	82.5	0:30 P	59.0	12 P	70.7	71.5	68.7	8.7
5	30.39	30.06	30.267	78.0	4 P	53.5	5 A	65.7	64.7	58.7	10.4
6	30.46	30.36	30.419	77.0	3 P	53.5	3 A	65.3	63.9	56.0	11.9
7	30.38	30.18	30.270	78.0	4 P	45.0	5 A	61.5	63.5	58.0	12.0
8	30.18	29.98	30.052	84.0	4 P	55.5	5 A	69.7	70.3	65.0	12.0
9	29 98	29.82	29.891	75.0	4:30 P	63.5	12 P	69.3	68.6	64.7	3.7
10	29.98	29.85	29.912	82.5	1:30 P	59.0	4:30 A	70.7	68.4	65.7	7.5
11	30.17	29.98	30.124	82.0	4 P	58.5	5 A	70.3	68.9	64.5	11.5
12	30.21	30.10	30.165	83.0	6 P	54.0	5 A	68.5	68.0	63.0	12.0
13	30.17	30.07	30.119	86.0	4 P	53.5	5:30 A	69.7	70.1	64.0	12.0
14	30.10	29.96	30.016	84.0	5 P	57.0	5 A	70.5	70.7	66.0	10.4
15	30.00	29.93	29.970	85.5	1:30 P	56.5	4:30 A	71.0	71.8	67.3	11.0
16	29.96	29.85	29.913	86.0	4 P	65.0	5 A	75.5	74.7	67.5	11.8
17	29.87	29.70	29.809	88.5	2:30 P	67.0	4 A	77.7	73.8	71.3	6.7
18	30.08	29.83	29.992	83.5	4:30 P	64.5	12 P	74.0	72.1	66.0	9.6
19	30.18	30.08	30.148	86.0	5 P	56.0	5:30 A	71.0	72.0	66.0	12.8
20	30.16	30.01	30.085	82.5	3 P	59.0	5 A	70.7	69.0	65.7	2.5
21	30.01	29.78	29.855	78.5	5 P	69.0	12 P	73.7	74.5	70.7	3.5
22	29.81	29.71	29.758	88.0	4 P	67.0	5 A	77.5	76.4	71.3	10.0
23	29.83	29.71	29.762	83.0	3 P	70.5	12 P	76.7	74.2	70.5	6.0
24	29.97	29 83	29.931	76 0	3 P	63.0	6 A	69.5	68.8	64.7	7.2
25	30.09	29.97	30.052	78 0	4 P	68.5	12 P	73.3	68.0	61.3	11.0
26	30.10	30 00	30.055	76.0	12 M	50.5	5 A	63.3	65.5	62.5	11.4
27	30.05	29.99	30.032	80.5	4 P	61.5	5 A	71.0	69.7	61.7	10.2
28	30.04	29 90	29.966	81.5	3 P	64.5	4 A	73.0	68.3	63.7	5.6
29	29.92	29.72	29.851	83.5	3:30 P	65.0	0 A	74.3	73.0	70.5	6.2
30	29.74	29.56	29.660	83.5	2:30 P	68.0	12 P	75 7	74.1	70.0	7.8
31	30.11	29.74	29.966	87.5	3 P	62.5	5 A	75.0	72.7	69.7	9.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	57.0	.571	84.5	N.W.	138	2.0	20	7 A	0 A	7 A	1.20	
2	65.5	.664	94.0	S.S.E.	162	1.0	14	11 A	3 A	12 P	.26	
3	68.0	.750	90.5	S.	206	3.0	24	6 P	0 A	10 P	.21	
4	67.0	.762	89.0	S.S.W.	80	6.5	36	12 M	1 P		T	
5	54.5	.603	72 0	N.N.W.	149	0.5	10	3 P				
6	49.0	.592	62.0	S.E.	93	0.0	—	—				
7	53.5	.600	69.0	E.S.E.	81	0.5	10	1 P				
8	62.0	.745	74.5	S.E.	64	2.5	22	5 P				
9	63.0	.677	85.5	S·S.E.	163	1.0	14	5 P	5 A	8 P	.05	
10	64.0	.689	86.5	E.N.E.	102	2.5	22	2 P	2 P	8:30 P	.54	
11	61.5	.722	76.5	N.	110	0.5	10	2 A				
12	59 5	.689	75.0	N.N.W.	69	0.5	10	12 M				
13	61.0	.722	74.5	N.W.	37	1.0	14	8 P				
14	64.0	.709	87.0	N.E.	88	0.5	10	12 M				
15	64.0	.784	76.0	S.S.E.	60	0.5	10	3 P	10 P	11 P	T	
16	64.5	.798	77.5	S.	166	2.0	20	7 P				
17	70.5	.797	94.0	S.S.E.	178	6.0	35	3 P	3 P	6 P	.20	
18	63.0	.756	77.0	W.S.W.	109	1.5	17	12 M	4:30 P	8 P	.01	
19	63.0	.758	77.0	S.E.	55	0.5	10	12 M				
20	65.5	.668	95.0	S.	82	2.5	22	6 P	9 A	5 P	T	
21	71.0	.768	98.0	S.E.	137	1.0	14	4 A	8 A	6 P	.26	
22	69.5	.878	81.5	S.	103	1.5	17	5 P				
23	70.5	.794	93.0	S.S.E.	233	3.0	24	11 A	3 A	12 P	.06	
24	62.0	.672	84.0	N.W.	55	0.0	—	—	0 A	2 A	.07	
25	57.0	.680	69.0	N.	157	1.5	17	1 A				
26	60.0	.641	82.5	N.E.	92	1.0	14	10 A	5:30 P		T	
27	57.5	.684	70.0	S.	83	0.0	—	—				
28	62.5	.632	89.5	S.	104	4.5	30	4 P	4 P	7 P	.26	
29	69.5	.786	92.0	S.	216	5.0	32	3 P	4 P	12 P	T	
30	69.0	.781	91.0	S.	343	4.0	28	3 P	0 A	7 P	.33	
31	68.0	.792	86.0	W.	58	0.0	—	—	4:30 P	8 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during the month was more uncomfortable than usual although there were no excessively hot days. This was due to the large number of days having a high relative humidity and the general sultriness of the air. Thunder storms were generally prevalent after the middle of the month.

The mean barometer was nearly normal and the range was rather large for the time of year. The fluctuations were generally small except near the beginning and the end of the month when considerable variation was noted. The prevailing direction of the wind near the south point was unusual for this station. The total wind movement was a little greater than usual.

The mean temperature was slightly higher than the normal while the maximum was unusually low. The range was small. The mean dew point was higher than normal and the relative humidity was nearly ten per cent. above the average.

The total precipitation was about seventy per cent. of the July mean. The rain was well distributed through the month. The amount of cloudiness was less than the normal and two-thirds of the days were recorded as fair.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 212. AUGUST, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.10, 2d, 10 A.
Minimum reduced to freezing,	29.38, 27th, 3 P.
Reduced† maximum reading,	30.38, 2d, 10 A.
Reduced† minimum reading,	29.66, 27th, 3 P.
Mean semi-daily reduced,	30.022
Monthly range,	0.72

****Air Temperature.*** In Degrees Fahr.

Highest,	90.5, 14th, 4 P.
Lowest,	47.5, 16th, 6 A.: 25th, 6 A.
Mean hourly,	70.5
Mean of means of max. and min.,	71.2
Mean sensible (wet bulb),	65.8
Monthly range,	43.0
Highest mean daily,	77.8, 23d
Lowest mean daily,	62.6, 15th
Mean maximum,	82.7
Mean minimum,	59.8
Mean daily range,	22.9
Greatest daily range,	34.0, 17th
Least daily range,	12.0, 3d

Humidity.

Mean dew point,	63.6
Mean force of vapor,	.726
Mean relative humidity,	82.9

Precipitation. In inches.

Total precipitation,	6.42
Number of days on which .01 inch or more rain or melted snow fell,	14

Wind.

Total movement,	3412 m.
Greatest daily movement,	225 m., 23d
Least daily movement,	47 m., 4th
Mean daily movement,	110 m.
Mean hourly velocity,	4.6 m.

Maximum pressure per square foot, 4.5 lbs.= 30 m. per hour, 21st, 5 P., S.

Maximum velocity for 5 minutes, 24 m. per hour 27th, 10:30 A., S.

Prevailing Direction, South, Southwast.

Summary.

South,	26 per cent.
Southwest,	13 " "
Northeast,	13 " "
Other directions,	48 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	163 hrs.=38 per cent.
Number of clear days,	11
Number of fair days,	14
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 266 hrs.=62%

Rain, 3d, 4th, 5th, 6th, 8th, 10th, 11th, 20th, 21st, 23rd, 24th, 26th, 27th, 30th, 31st.

Gales, 35 miles or more per hour, none.

Thunder and Lightning, 4th, 5th, 6th, 8th, 21st, 22d, 27th, 30th.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.33	30.11	30.265	75.5	5 P	61.0	12 P	68.3	68.3	62.0	2.4
2	30.38	30.31	30.350	77.5	2 P	57.5	4 A	67.5	68.8	63.0	8.1
3	30.31	30.16	30.236	75.0	4 P	63.0	5 A	69.0	68.9	66.3	3.0
4	30.16	29.99	30.047	82.0	3 P	67.0	12 P	74.5	72.1	68.7	4.0
5	30.12	30.05	30.090	89.0	4 P	63.5	5 A	76.3	75.4	71.3	10.0
6	30.09	29.97	30.050	90.0	12 M	68.0	6 A	79.0	76.1	73.7	6.5
7	30.05	29.95	30.006	89.0	4 P	64.5	5 A	76.7	76.1	70.3	11.8
8	29.98	29.91	29.953	82.5	1:30 P	63.0	12 P	72.7	70.3	66.3	4.7
9	30.01	29.97	30.004	87.0	2:30 P	60.5	3 A	73.7	71.6	66.0	6.7
10	30.02	29.89	29.964	79.0	11 A	54.0	5 A	66.5	68.0	66.7	7.6
11	20.89	29.78	29.844	84.0	3 P	68.0	6 A	76.0	73.5	68.0	7.0
12	30.11	29.85	29.989	84.0	4 P	60.0	12 P	72.0	72.2	66.5	12.0
13	30.19	29.94	30.078	78.5	4 P	49.5	5 A	64.0	64.4	60.0	12.5
14	29.94	29.75	29.824	82.0	3:30 P	54.0	5 A	68.0	67.6	60.3	13.0
15	29.97	29.82	29.890	77.0	5 P	48.0	6 A	62.5	62.6	56.3	13.0
16	30.09	29.97	30.044	81.0	5 P	47.5	6 A	64.3	64.6	59.3	13.5
17	30.20	30.09	30.182	85.5	3 P	51.5	6 A	68 5	68.5	63.7	13.5
18	30.23	30.15	30.188	87.0	3:30 P	57 5	5 A	72.3	71.1	66.3	9.5
19	30.20	30.10	30.155	90.5	4 P	62.5	3 A	76.5	74.7	69.0	8.2
20	30.14	29.98	30.040	87.0	2 P	69.0	4 A	78.0	76.1	74.0	8.5
21	29.98	29.88	29.916	81.5	3 P	68.5	6 P	75.0	72.5	72.3	2.5
22	29.91	29.83	29.882	86.5	2 P	71.5	6 A	79.0	75.9	73.0	8.3
23	29.88	29.72	29.795	87.0	4 P	69.0	12 P	78.0	77.8	73.5	5.6
24	30.23	29.88	30.134	76.0	3 P	55.0	12 P	65.3	65.9	59.0	10.2
25	30.28	30.19	30.241	76.0	4 P	47.5	6 A	61.7	63.2	57.5	11.5
26	30.20	29.94	30.052	82.5	3 P	58.0	4 A	70.3	69.9	66.3	6.8
27	29.94	29.66	29.721	85.0	0:30 P	68.0	12 P	76.5	73.2	71.3	2.1
28	30.00	29.74	29.959	81.0	5 P	56.0	12 P	68.5	68.9	61.7	11.0
29	30.04	29.95	30.003	81.5	3:30 P	50.0	6 A	66.0	65.4	61.3	11.5
30	29.98	29.81	29.905	87.5	4 P	64.0	3 A	75.7	74.0	68.5	9.4
31	29.95	29.84	29.884	77.0	2 P	56.0	12 P	66.5	68.4	59.0	11.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	58.0	.672	73.5	N.E.	117	0.5	10	2 A				
2	60.5	.668	79.0	N.E.	109	0.5	10	12 M				
3	64.5	.699	88.0	N.N.W.	83	0.0	—	—	6 A	12 P	.03	
4	68.5	.730	95.5	S.E.	47	0.5	10	12 M	0 A	9 A	.78	
5	70.0	.842	89 5	S.E.	58	0.5	10	5 P	5 A	9 A	.01	
6	73.5	.871	93.0	N.E.	98	2.0	20	2 P	2 P	10 P	.14	
7	67.5	.890	76.0	W.	49	0.0	—	—				
8	65.0	.703	88.5	W.N.W.	85	2.5	22	1 A	0 A	9 A	1.70	
9	64.0	.733	81.5	N.	75	0.0	—	—				
10	65.0	.727	85.5	N.N.E.	52	1.0	14	12 M	2 P	12 P	.02	
11	67.0	.742	89.0	S.	141	2.5	22	6 P	0 A	9 P	.03	
12	64.0	.791	75.5	N.N.W.	124	2.0	20	11 A				
13	57.0	.608	79.0	S.W.	96	0.5	10	4 P				
14	55.5	.672	67.0	N.W.	109	1.5	17	12 M				
15	51.0	.575	65.5	S.W.	92	1.0	14	2 P				
16	55.5	.606	73.5	W.	59	0.5	10	12 M				
17	61.5	.648	86.5	S.S.W.	49	0.0	—	—				
18	65.0	.706	88.0	S.	91	0.5	10	5 P				
19	67.5	.785	87.5	S.	118	1.5	17	3 P				
20	73.5	.890	92.0	S.	205	1.5	17	8 P	11 P	12 P	.01	
21	72.0	.808	97.5	S.W.	148	4.5	30	5 P	0 A	7 P	2.06	
22	72.5	.846	94.0	S.	138	2.0	20	3 P				
23	72.0	.920	86.0	S.W.	225	3.5	26	12 P	6 P	10 P	.24	
24	55.5	.555	83.5	N.E.	204	2.5	22	3 A	3:30 A	4:30 A	.03	
25	53.5	.576	71.5	S.S.E.	63	1.0	14	12 M				
26	64.5	.724	85.0	S.	75	0.5	10	2 P	11 P	12 P	.01	
27	71.0	.791	95.5	S.	206	4.0	28	12 M	0 A	11 P	1.34	
28	59.0	.648	77.0	N.W.	101	1.0	14	8 A				
29	58.0	.632	77.5	S.	59	0.0	—	—				
30	66.5	.788	84.0	S.S.W.	134	0.5	10	12 M	6 P		T	
31	54.0	.648	66.0	W.N.W.	202	3.5	26	12 M	2 A	3 A	.02	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during August was of the same general character as that of July, the predominating features being the high humidity and numerous thunder storms. The week beginning with the 12th was, however, an exception to the general character of the month, the days being clear and pleasant. The precipitation was much greater than during July, as the thunder storms were much more severe.

The mean barometer was slightly higher than the normal, while the maximum and minimum were nearly the usual records. The total wind movement was about 15 per cent more than usual, although not a single gale was noted. South wind predominated, as during July.

The mean temperature was about three degrees above the normal, the maximum was normal and the minimum was high, giving a smaller range than usual. The relative humidity was higher than any previous August record at this station, and slightly higher than the abnormal record of the previous month. The mean dew point was also unusually high.

The total precipitation was about two inches more than the normal, and much of it was accompanied by thunder and lightning. The storm on the 21st was made up of a number of distinct showers, and the thunder and lightning was the most severe of the season.

The percentage of cloudiness was considerably less than usual.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 213. SEPTEMBER, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.20, 16th, 9 A.; 25th, 8 A.
Minimum reduced to freezing, . 29.18, 3d, 11 A.
Reduced† maximum reading, 30.50, 16th, 9 A.; 25th, 8 A.
Reduced† minimum reading, . 29.47, 3d, 11 A.
Mean semi-daily reduced, ... 30.090
Monthly range, ... 1.03

****Air Temperature.*** In Degrees Fahr.

Highest, ... 91.0, 18th, 3:30 P.
Lowest, ... 31.5. 25th, 6:30 A.
Mean hourly, ... 64.0
Mean of means of max. and min., ... 63.8
Mean sensible (wet bulb), ... 58.1
Monthly range, ... 59.5
Highest mean daily, ... 74.5, 19th
Lowest mean daily, ... 49.5, 25th
Mean maximum, ... 76.3
Mean minimum, ... 51.2
Mean daily range, ... 25.1
Greatest daily range, ... 38.0, 18th
Least daily range, ... 3.0, 22d

Humidity.

Mean dew point, ... 55.2
Mean force of vapor, ...566
Mean relative humidity, ... 80.1

Precipitation. In inches.

Total precipitation, ... 2.59
Number of days on which .01 inch or more rain or melted snow fell, ... 7

Wind.

Total movement, ... 4249 m.
Greatest daily movement, ... 345 m., 3d
Least daily movement, . . . 50 m., 10th, 22d
Mean daily movement, ... 142 m.
Mean hourly velocity, ... 5.9 m.
Maximum pressure per square foot, 4.5 lbs.= 30 m. per hour, 23d, 12 P., W.N.W.
Maximum velocity for 5 minutes, 24 m. per hour 3d, 4 P., W.
Prevailing Direction, West, Southwast.

Summary.

South, ... 27 per cent.
Northwest, ... 13 " "
North Northwest, ... 13 " "
Other directions, ... 47 " "

Weather.

Mean cloudiness observed, ... 32per cent.
Total cloudiness recorded by the Sun Thermometer, ... 119 hrs.=32 per cent.
Number of clear days, ... 15
Number of fair days, ... 10
Number of cloudy days, ... 5

Bright Sunshine.

Number of hours recorded, . . 254 hrs.=68%

Rain, 3d, 12th, 13th, 20th, 21st, 22d, 27th, 29th, 30th.

Gales, 35 miles or more per hour, none.

Thunder and Lightning, 12th, 14th.

Moderate Frost, 25th.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.17	29.95	30.114	71.5	3:30 P	48.5	6 A	60.0	59.1	52.5	10.8
2	30.17	29.84	30.021	76.0	2 P	40.5	6 A	58.3	60.2	54.5	9.1
3	29.84	29.47	29.604	81.0	3 P	61.0	12 P	71.0	68.7	61.3	8.3
4	30.20	29.74	30.016	69.0	3 P	47.0	12 P	58.0	59.7	51.7	10.3
5	30.31	30.21	30.258	73.0	4:30 P	39.0	6 A	56.0	56.4	52.7	12.0
6	30.21	29.94	30.054	83.0	3:30 P	49.0	5 A	66.0	65.5	59.7	11.3
7	29 98	29.74	29.864	83.0	4 P	52.0	6 A	67.5	68.3	61.7	10.3
8	29.92	29.78	29.899	81.0	5 P	58.5	6 A	69.7	67.0	59.5	11.6
9	29.90	29.73	29.832	89.0	4 P	60.5	6 A	74.7	71.3	64.5	8.1
10	30 03	29.78	29.914	90.0	3:30 P	59.5	6 A	74.7	72.9	65.3	10.6
11	30.14	30.03	30.134	81.0	3 P	61.0	6 A	71.0	69.3	64.0	9 0
12	30.12	30.02	30.081	77.0	2:30 P	64.5	4 A	70.7	67.9	66.0	2.0
13	30.03	29.83	29.907	82.0	2:30 P	65.0	0 A	73.5	73.1	69.7	5.9
14	30.24	29.82	30.060	74.0	2 P	53.0	12 P	63.5	67.7	57.3	8.9
15	30.43	30.24	30.396	70.5	4 P	45.0	6 A	57.7	58.0	51.0	11.5
16	30.50	30.38	30.463	70.0	3 P	39.0	6:30 A	54.5	55.5	50.7	11.5
17	30.40	30.13	30.243	72.0	4 P	43.5	2:30 A	57.7	60.8	57.0	10.8
18	30.15	30.01	30.090	91.0	3:30 P	53.0	6:30 A	72.0	71.6	63.5	1.7
19	30.05	29.97	30.030	90.0	3 P	59.0	7 A	74.5	74.5	66.7	10.5
20	30.05	29.85	29.978	81.0	1 P	62.0	6 A	71.5	72.3	68.5	5.3
21	30.04	29.82	29.943	87.0	3 P	62.0	12 P	74.5	74.0	67.0	8.3
22	30.15	29.87	30.063	62.0	8 A	59.0	3 A	60.5	61.3	59.7	0.0
23	30.04	29.80	29.866	77.5	3:30 P	60.0	6:30 A	68.7	67.5	62.3	10.5
24	30.40	30.04	30.279	64.0	3 P	42.0	12 P	53.0	53.2	45.5	10.8
25	30.50	30.40	30.458	65.0	4 P	31.5	6:30 A	48.3	49.5	44.5	11.1
26	30.43	30.24	30.352	71.0	3 P	40.0	6 A	55.5	57.6	52.7	10.5
27	30.31	30.10	30.201	74.0	3:30 P	51.0	12 P	62.5	62.9	58.3	3.3
28	30.41	30.31	30.376	72.0	4 P	44.5	6:30 A	58.3	57.2	51.3	11.1
29	30.36	29.95	30.185	68.0	2 P	40.0	4:30 A	54.0	55.9	53.0	3.6
30	30.15	29.85	30.020	64.0	2 P	47.0	12 P	55.5	59.7	52.0	5.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	46.0	.518	62.0	W.	150	3.0	24	12 M				
2	50.0	.522	71.0	S.	172	3.0	24	8 P				
3	58.5	.623	79.5	S.W.	345	4.0	28	4 P	7 A	11:30 A	.32	
4	45.0	.502	63.0	N.N.W.	166	1.0	14	2 P				
5	50.0	.451	80 0	S.	76	0.5	10	5 P				
6	55.0	.625	70.5	S.S.W.	198	1.0	14	2 P				
7	59.0	.661	77.5	N.W.	117	2.0	20	3 P				
8	57.0	.585	82.0	S.	88	1.5	17	10 P				
9	62.5	.692	83.5	S.S.E.	166	1.5	17	2 P				
10	62.5	.722	80.0	N.	50	0.5	10	8 P				
11	61.5	.684	80.5	S.	149	1.5	17	2 P				
12	66.0	.663	95.5	S.S.E.	92	2.5	22	3 P	3 P	4:30 P	.02	
13	69.5	.790	91.0	S.	172	1.5	17	1 P	8 A	8:30 A	T	
14	53.0	.570	71.0	N.N.W.	242	1.5	17	10 A				
15	44.0	.472	57.0	N.N.E.	177	1.0	14	9 A				
16	48.5	.410	83.0	E.N.E.	126	0.5	10	11 A				
17	55.0	.512	88.0	S.	97	0.5	10	4 P				
18	61.0	.661	85.5	S.W.	84	0.5	10	3 P				
19	65.0	.724	87.0	N.N.W.	57	0.0	—	—				
20	68.0	.727	94.5	W.S.W.	95	0.5	10	3 A	7:30 P	12 P	.38	
21	66.0	.713	89.5	N.	110	1.5	17	12 M	0 A	1 A	.02	
22	57.5	.553	88.0	N.E.	50	0.0	—	—	7 A	9 P	1.06	
23	59 5	.641	80.0	N.W.	122	4.5	30	12 P				
24	40.0	.374	67.5	N.N.W.	206	3.0	24	2 P				
25	39.5	.326	70.5	S.S.W.	78	0.0	—	—				
26	51.0	.435	86.5	S.	206	3.5	26	2 P				
27	56.5	.527	87.5	W.	181	1.0	14	10 A	2:30 A	11:30 A	.23	
28	48.0	.435	76.0	N.W.	88	0.5	10	9 A				
29	52.0	.435	93.5	S.	130	2.0	20	3 P	8 P	12 P	T	
30	49.5	.432	83.0	N.W.	259	4.0	28	10 P	0 A	10 A	.56	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during September was generally pleasant. The most noticeable features were the large amount of sunshine and the small amount of precipitation. The month also proved to be somewhat warmer than usual.

An analysis of the records for the month shows the following features: The mean barometer was slightly above the normal and the range rather large. The total wind movement was about a third more than the normal but not a single gale was noted.

The mean temperature was about three and one-half degrees higher than the normal, and the maximum of 91° on the 18th was the highest record for the season. The minimum was slightly lower than usual giving a large range for the month. A moderate frost was noted on the morning of the 25th but the damage resulting was slight.

The total precipitation was about sixty per cent of the normal and nearly all of it fell during the last third of the month. There were but five cloudy days during the month.

The mean dew point and relative humidity were both slightly higher than the usual September records.

J. E. OSTRANDER. Meteorologist.

R. C. LINDBLAD, Acting Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 214. OCTOBER, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.32, 13th, 8 A.;
Minimum reduced to freezing, 28.93, 6th, 7 P.
Reduced† maximum reading, 30.63, 13th, 8 A.;
Reduced† minimum reading, 29.22, 6th, 7 P.
Mean semi-daily reduced, ... 30.094
Monthly range, ... 1.41

****Air Temperature.*** In Degrees Fahr.

Highest, ... 77.5, 5th, 3:00 P.
Lowest, ... 24.0, 13th, 7:00 A.
Mean hourly, ... 50.5
Mean of means of max. and min., ... 51.4
Mean sensible (wet bulb), ... 45.7
Monthly range, ... 53.5
Highest mean daily, ... 63.1, 5th
Lowest mean daily, ... 38.8, 13th
Mean maximum, ... 62.4
Mean minimum, ... 40.4
Mean daily range, ... 22.0
Greatest daily range, ... 41.0, 14th, 15th
Least daily range, ... 5.5, 21st

Humidity.

Mean dew point, ... 42.9
Mean force of vapor, ...347
Mean relative humidity, ... 84.1

Precipitation. In inches.

Total precipitation, ... 5.69
Number of days on which .01 inch or more rain or melted snow fell, ... 6

Wind.

Total movement, ... 4398 m.
Greatest daily movement, ... 357 m., 28th
Least daily movement, ... 33 m., 13th,
Mean daily movement, ... 142 m.
Mean hourly velocity, ... 5.9 m.
Maximum pressure per square foot, 9.0 lbs.= 42 m. per hour, 9th, 3 P., S.
Maximum velocity for 5 minutes, 42 m. per hour 9th, 4 P., S.
Prevailing Direction, West, Southwest.

Summary.

West, ... 13 per cent.
North Northwest, ... 13 " "
Southwest, ... 10 " "
Southeast, ... 10 " "
Other directions, ... 54 " "

Weather.

Mean cloudiness observed, ... 52 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 152 hrs.=45 per cent.
Number of clear days, ... 10
Number of fair days, ... 11
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . 189 hrs.=55%

Rain, 6th, 9th, 10th, 11th, 20th, 24th, 25th, 30th, 31st.

Thunder and Lightning, 9th.

Gales, 35 miles or more per hour, 42 m. 9th, S.; 35 m.; 30th., N. W,

Frosts, 1st, 8th, 11th, 12th, 13th, 14th, 15th.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.24	30.12	30.193	64.0	4 P	33.5	6:30 A	48.7	48.5	43.5	10.5
2	30.15	30.00	30.076	70.0	3 P	40.0	6:30 A	55.0	51.9	46.3	10.0
3	30.10	30.04	30.081	75.0	2:30 P	37.0	6 A	56.0	54.0	48.7	9.9
4	30.11	30.00	30.061	75.5	4 P	39.5	6 A	57.5	55.7	50.3	10.6
5	30.01	29.82	29.866	75.5	3 P	49.0	0 A	63.3	63.1	58.0	10.5
6	29.81	29.22	29.488	66.0	1:30 P	52.5	12 P	59.3	61.5	57.5	0.0
7	29 96	29.36	29.723	54.0	11.30 A	44 0	7 A	49.0	49.7	44.0	6.0
8	30.21	29.96	30.206	61.0	3 P	32.5	7 A	46.7	47.4	40.7	10.1
9	30.16	29.75	29.916	74.0	1:30 P	42.0	0 A	58.0	55.7	49.5	5.3
10	29 82	29.66	29.724	54.0	4:30 P	40.0	12 P	47.0	47.7	45.3	3.1
11	30.03	29.72	29.861	50.0	0:30 P	34.5	7 A	42.3	40.9	36.7	4.5
12	30.48	30.03	30.365	52.5	2 P	29.5	12 P	41.0	39.7	36.0	10.3
13	30.63	30.49	30.604	58.5	3:30 P	24.0	7 A	41.3	38.8	33.5	10.0
14	30.57	30.35	30.465	67.0	5 P	26.0	6 A	46 5	44.1	38.0	10.0
15	30.38	30.27	30.316	74.0	3:30 P	33.0	7 A	53.5	50.9	44.0	9.8
16	30.45	30.28	30.382	68.0	3 P	39.5	5 A	53.7	51.6	44.0	7.4
17	30.49	30.43	30.470	57.0	3 P	47.0	12 P	52.0	50.1	45.0	5.3
18	30.45	30.29	30.384	68.5	3 P	47.0	0 A	57.7	52.4	50.0	3.0
19	30.29	30.01	30.098	73.0	3 P	53 0	0 A	63.0	62.8	59.3	6.0
20	30.21	30.00	30.111	64.0	9 A	55.0	12 P	59.5	59.7	60.0	0.0
21	30.36	39.21	30.355	58.0	3 P	52.5	6 A	55.3	54.9	48.0	0.0
22	30.34	30.17	30.275	64.0	6 P	49.5	8 A	56.7	54.0	48.0	4.0
23	30.17	30.02	30.107	67.0	4 P	50.0	3 A	58.5	56.7	52.5	5.2
24	30.27	30.05	30.207	62.0	3 P	40 5	6:30 A	51.3	52.0	46.3	9.3
25	30.05	29.67	29.771	68.0	3 P	46.0	12 P	57.0	56.3	51.5	5.0
26	30.03	29.92	30.017	59.0	3 P	36.0	6 A	47.5	46.7	41.5	9.6
27	30.02	29.52	29.777	67.0	3 P	32.0	7 A	49.5	50.2	47.0	6.3
28	29.73	29.51	29.627	56.0	12 M	43.0	12 P	49.5	50.7	43.0	6.5
29	30.13	29.73	29.990	45.5	4 P	35.0	12 P	40.3	39.7	35.0	1.3
30	30.19	30.13	30.191	43 5	3 P	34.5	3 A	39 0	39.1	36.5	0.0
31	30.23	30.18	30.228	42.5	12 M	36.0	12 P	39 3	39 4	37.0	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	41.5	.302	87.0	W.	122	1.0	14	7 A				
2	45.0	.324	93.0	W.	38	1.0	14	12 M				
3	47.5	.370	89.0	S.S.E.	45	0.5	10	7 A				
4	49.0	.382	93.5	E.S.E.	34	0.5	10	5 A				
5	56.5	.527	86 5	S.S.E.	67	0.5	10	12 M				
6	56.0	.507	89.5	S.	202	4.5	30	6 P	6:30 A	7 P	.10	
7	42.0	.310	94.5	W.	341	5.0	32	9 A				
8	36.0	.291	74.5	S.S.W.	169	1.5	17	6 P				
9	48.0	.369	91.5	S.	285	9.0	42	3 P	3 P	12 P	2.22	
10	44.5	.306	96.0	N.W.	83	0.0	—	—	0 A	8:30 A	.08	
11	35.0	.224	93.5	S.W.	149	4.5	30	2 P	10 A	5 P	T	
12	32.5	.233	82.5	N.W.	101	0.5	10	1 P				
13	31.0	.201	88.0	W.S.W.	33	0.5	10	3 P				
14	35 0	.254	83.5	S.E.	34	0.5	10	7 A				
15	41.5	.318	82.5	N.E.	41	0.5	10	12 M				
16	39.5	.333	75.0	N.N.E.	79	1.5	17	12 M				
17	41.0	.342	74.5	N.N.E.	166	1.0	14	12 M				
18	48.5	.382	91.5	E.	134	1.0	14	12 M				
19	58.0	.552	89.0	E.S.E.	167	2.0	20	5 P				
20	59.5	.526	98.5	N.N.W.	204	3.0	24	11 A	5 A	11 P	1.77	
21	41.5	.427	62.0	N.	194	2.5	22	10 A				
22	44.5	.378	77.0	S.W.	110	0.5	10	2 A				
23	51.5	.426	88.5	N.	90	1.0	14	10 P				
24	43.0	.355	78.5	S.E.	126	1.0	14	9 P	11 P	12 P	T	
25	49.0	.465	86.0	W.	141	1.5	17	10 A	0 A	9 A	1.50	
26	37.5	.295	76.0	N.N.W.	77	0.5	10	12 M				
27	46 0	.376	91.5	S.E.	67	4.5	30	10 P				
28	35.5	.346	62.0	S.W.	357	4.0	28	10 A				
29	28.5	.234	68.5	W.S.W.	325	6.0	35	8 A				
30	32.5	.235	79.0	N.N.W.	132	0.5	10	1 P	10 A	11 P	.02	
31	34.0	.236	85.5	N.N.W.	285	4.0	28	10 P	8:30 A	3 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during October was generally pleasant the first part of the month and rather cold and cloudy the last part. Several heavy rains, a high relative humidity, and a number of windy days were the most noticeable features.

The mean pressure for the month was slightly above the average and the range was unusually large for the season, as a result of a high maximum and low minimum. The wind direction was more variable than usual and the total movement about ten per cent more than normal.

The mean temperature was nearly normal and the maximum and minimum records about the usual figures. On a number of dates, however, the daily range was unusually large. A number of frosts were noted; those on the mornings of the 12th and 13th being the most severe.

The mean relative humidity was more than ten per cent higher than the normal while the mean dew point was but little above the average.

The total precipitation was more than sixty per cent above the normal and yet the number of stormy days were few. Nearly the whole amount fell during the heavy rains of the 9th, 20th and 25th. On the first of these dates there was thunder and lightning. About the usual amount of sunshine was noted.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 215. NOVEMBER, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.11, 4th, 9 A.;
Minimum reduced to freezing, 29.05, 16th, 3 A.
Reduced† maximum reading, 30.42, 4th, 9 A.;
Reduced† minimum reading, 29.37, 16th, 3 A.
Mean semi-daily reduced, ... 30.038
Monthly range, ... 1.05

****Air Temperature.*** In Degrees Fahr.

Highest, ... 62.0, 3d, 2:00 P.
Lowest, ... 18.5, 30th, 6:00 A.
Mean hourly, ... 38.5
Mean of means of max. and min., ... 38.7
Mean sensible (wet bulb), ... 33.5
Monthly range, ... 43.5
Highest mean daily, ... 50.4, 19th
Lowest mean daily, ... 27.2, 15th
Mean maximum, ... 47.4
Mean minimum, ... 30.0
Mean daily range, ... 17.4
Greatest daily range, ... 33.0, 17th,
Least daily range, ... 3.5, 21st

Humidity.

Mean dew point, ... 27.7
Mean force of vapor, ...223
Mean relative humidity, ... 72.2

Precipitation. In inches.

Total precipitation, ... 1.98
Number of days on which .01 inch or more rain or melted snow fell, ... 12
Total snow in inches, ... 4

Wind.

Total movement, ... 5978 m.
Greatest daily movement, ... 480 m., 1st
Least daily movement, ... 52 m., 9th,
Mean daily movement, ... 199 m.
Mean hourly velocity, ... 8.3 m.
Maximum pressure per square foot, 8.5 lbs.= 41 m. per hour, 22d, 9 P., W.N.W.
Maximum velocity for 5 minutes, 33 m. per hour 29th, 9 A., N.N.W.
Prevailing Direction, Northwest.

Summary.

North Northwest, ... 27 per cent.
North, ... 17 " "
West, ... 13 " "
West, Northwest, ... 13 " "
Northwest, ... 10 " "
Other directions, ... 20 " "

Weather.

Mean cloudiness observed, ... 53 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 138 hrs.=47 per cent.
Number of clear days, ... 13
Number of fair days, ... 5
Number of cloudy days, ... 12

Bright Sunshine.

Number of hours recorded, . . 155 hrs.=53%

Rain, 9th, 10th, 11th, 12th, 18th, 20th, 21st, 22d, 26th, 27th, 28th, 30th.

Snow, 11th, 13th, 15th, 16th, 28th, 30th.

Days Sleighing. 2.

Gales, 35 miles or more per hour, 35 m. 1st, N.N.W.; 41 m. 22d, W.N.W.; 39 m. 23d, W.N.W.; 39 m. 29th, N.N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.32	30.22	30.283	44.5	2 P	32.5	6:30 A	38.5	37.1	32.3	9.5
2	30.22	30.12	30.191	52.0	2 P	31.5	2 A	41.7	42.0	35.0	9.4
3	30.35	30.17	30.260	62.0	2 P	34.0	6 A	48.0	47.4	41.0	9.3
4	30.42	30.31	30.402	54.0	3 P	34.5	6 A	44.3	41.6	34.5	9.4
5	30.33	30.07	30.179	57.0	3 P	24.5	7 A	40.7	41.9	32.7	8.4
6	30.10	29.97	30.061	54.5	2 P	31.5	7 A	43.0	42.4	31.5	9.2
7	30.06	29.91	30.013	50.5	3 P	26.0	7 A	38.3	38.4	31.3	9.4
8	30.16	30.06	30.139	48.0	3:30 P	28.0	12 P	38.0	36.5	30.7	9.5
9	30.17	29.98	30.098	48.0	2:30 P	20.0	6:30 A	34.0	34.8	30.3	7.1
10	29.98	29.83	29.897	55.0	1:30 P	32.0	12 P	43.5	42.0	37.0	5.5
11	29.92	29.59	29.803	43.5	12 M	32.0	0 A	37.7	35.7	34.0	0.0
12	29.59	29.49	29.540	41.0	4 P	32.0	6 A	36.5	36.2	34.5	1.0
13	29.67	29.52	29.622	36.0	3 P	28.0	11 P	32.0	32.4	26.3	3.7
14	29.95	29.64	29.836	36.0	4:30 P	22.0	12 P	29.3	29.7	25.0	1.5
15	30.02	29.43	29.791	36.5	9 P	19.5	4 A	28.0	27.2	26.3	0.0
16	29.85	29.37	29.647	35.0	3 P	27.0	3 A	31.0	31.9	28.5	4.0
17	30.01	29.85	29.993	57.5	1:30 P	24.5	6 A	41.0	37.8	34.7	8.5
18	30.05	29.90	30.012	56.0	5 P	35.0	3 A	45.5	46.9	45.3	1.0
19	30.24	30.01	30.207	60.5	2 P	36.0	12 P	48.3	50.4	41.3	8.5
20	30.25	30.11	30.188	51.0	2 P	36.0	0 A	43.5	46.3	40.7	0.2
21	30.17	30.03	30.118	40.5	1 P	37.0	7 A	38.7	38.8	35.3	0.0
22	30.04	29.80	29.897	52.0	2:30 P	36.5	5 A	44.3	42.2	38.5	3.5
23	30.18	30.04	30.166	45.0	1 P	35.0	12 P	40.0	40.7	34.3	8.2
24	30.21	30.10	30.159	43.5	2 P	32.0	12 P	37.7	37.0	31.5	5.5
25	30.19	30.07	30.150	54.5	2 P	29.5	7 A	42.0	37.5	29.7	7.8
26	30.25	29.97	30.124	48.0	2 P	35.0	0 A	41.5	44.1	41.3	0.5
27	30.10	29.91	29.936	48.5	1 P	36.0	5 A	42.3	41.8	38.3	2.5
28	30.10	29.93	30.016	40.0	0 A	31.5	8 P	35.7	34.2	31.7	0.0
29	30.32	30.00	30.269	33.5	2 P	21.0	12 P	27.3	28.0	22.3	7.8
30	30.33	29.96	30.138	38.0	6 P	18.5	6 A	28.3	31.2	28.7	4.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	24.5	.212	64.5	N.N.W.	480	6.0	35	9 P				
2	23.5	.259	50.5	N.W.	335	5.5	33	8 A				
3	35.5	.307	68.0	N.N.W.	281	5.5	33	6 P				
4	27.5	.236	62.5	N.	289	2.5	22	6 A				
5	22.0	.242	52 5	N.	139	1.0	14	10 A				
6	18.0	.227	45.0	N.	259	3.0	24	4 P				
7	22.0	.209	59.5	N.N.W.	238	4.5	30	3 P				
8	25.0	.193	69.5	N.	168	1.0	14	11 A				
9	26.5	.185	79.5	W.	52	1.0	14	11 P	10 P	12 P	.01	
10	35.0	.229	91.5	N.W.	136	1.5	17	1 P	0 A	5 A	.04	
11	33.5	.198	97.5	N.N.W.	86	1.5	17	9 P	2 A	12 P	.95	T
12	32.0	.208	88.5	W.	142	0.5	10	6 P	0 A	2 P	.08	
13	15.5	.170	53.5	W.S.W.	236	2.5	22	12 M	3 P			T
14	18.5	.153	69.0	W.	125	2.5	22	12 M				
15	24.5	.150	90.5	N.N.W.	130	4.0	28	12 P	12 M	12 P	.59	4
16	24.5	.180	76.0	W.N.W.	368	4.0	28	11 P	0 A	9 A		T
17	32.5	.215	86.0	S.S.E.	160	2.5	22	1 A				
18	44.0	.330	92.5	S.	149	1.0	14	6 P	2 P	9 P	.01	
19	36.0	.306	69.5	N.W.	123	0.5	10	12 M				
20	34.5	.303	67.5	N.N.W.	55	0.5	10	4 A	1 P	12 P	.02	
21	32.0	.223	82.5	N.	92	0.0	—	—	0 A	12 P	.10	
22	34.5	.261	78.5	W.N.W.	186	8.5	41	9 P	0 A	10 A	.05	
23	25.5	.240	58.0	W.N.W.	430	7.5	39	0 A				
24	25.5	.204	68.0	W.N.W.	240	3.0	24	11 A				
25	19.5	.204	52.0	W·S.W.	133	1.0	14	12 M				
26	35.5	.292	76.0	S.	105	1.0	14	6 P	11 A	12 P	.03	
27	35.0	.248	84.0	W.	160	4.0	28	1 P	0 A	10 A	.06	
28	29.5	.185	90.0	N.E.	67	2.0	20	12 P	6 A	1 P	.04	T
29	16.5	.132	72.0	N.N.W.	429	7.5	39	8 A				
30	22.5	.180	70.0	N.N.W.	185	1.0	14	8 A	3 P	10 P	T	T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The first third of the month was marked by cool, clear days. The remainder of the month was generally cloudy, and numerous light rains occurred. A considerable snowfall on the 15th was unusual for this station. The most abnormal features were the large amount of wind, small precipitation and high minimum temperature.

Comparing the record with those of former years the following features are noted: The mean barometer was practically normal and the maximum was low, giving a range considerably smaller than usual.

The total wind movement was nearly 30 per cent more than usual, and was larger than any previous November record at this station. On three dates the daily record exceeded 400 miles—a very unusual record here. All the gales noted were from the northwest quadrant.

The mean temperature was about a degree above the normal. The maximum was slightly below the average while the minimum was 8 degrees higher than usual, giving a new high minimum record for November. The range was 10 degrees less than normal.

The mean dew point was 3 degrees below the average and the relative humidity was lower than usual.

The total precipitation was about 60 per cent of the normal. Three-fourths of it occurred on two dates in well-defined storms. The remainder was scattered over a number of days, occurring in light storms of a few hundredths only. The amount of cloudiness was less than the average.

J. E. OSTRANDER, Meteorologist.

T. A. BARRY, Observer.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No. 216. DECEMBER, 1906.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.44. 19th, 9 A.;
Minimum reduced to freezing,	29.16, 3d, 3 P.
Reduced† maximum reading,	30.77, 19th, 9 A.;
Reduced† minimum reading,	29.47, 3d, 3 P.
Mean semi-daily reduced,	30.124
Monthly range,	1.30

****Air Temperature.*** In Degrees Fahr.

Highest,	45.5, 1st, 1 P.
Lowest,	—3.0, 8th, 7:00 A.
Mean hourly,	24.2
Mean of means of max. and min.,	24.1
Mean sensible (wet bulb),	21.2
Monthly range,	48.5
Highest mean daily,	40.0, 1st
Lowest mean daily,	4.4, 8th
Mean maximum,	31.5
Mean minimum,	16.7
Mean daily range,	14.8
Greatest daily range,	35.0, 7th,
Least daily range,	3.0, 21st

Humidity.

Mean dew point,	16.5
Mean force of vapor,	.135
Mean relative humidity,	77.0

Precipitation. In inches.

Total precipitation,	4.49
Number of days on which .01 inch or more rain or melted snow fell,	10
Total snow in inches,	12

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5554 m.
Greatest daily movement,	441 m., 2d
Least daily movement,	28 m., 17th,
Mean daily movement,	179 m.
Mean hourly velocity,	7.5 m.

Maximum pressure per square foot, 12.0 lbs.= 40 m. per hour, 1st, 6 P., W.N.W.

Maximum velocity for 5 minutes, 36 m. per hour 1st, 7 P., W.N.W.

Prevailing Direction, North, Northwest.

Summary.

North,	19 per cent.
North Northwest,	16 " "
North, Northeast,	13 " "
West,	10 " "
West, Northwest,	10 " "
South, Southwest,	10 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed,	66 per cent.
Total cloudiness recorded by the Sun Thermometer,	172 hrs.=61 per cent.
Number of clear days,	9
Number of fair days,	6
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, 111 hrs.=39%

Rain, 6th, 10th, 15th, 20th, 21st, 22d, 30th, 31st.

Snow, 1st, 3d, 4th, 6th, 8th, 9th, 13th, 15th, 20th, 22d, 23d, 25th, 27th, 28th.

Days Sleighing 21.

Gales, 35 miles or more per hour, 49 m. 1st, W.N.W.; 37 m. 2d, W.N.W.; 37 m. 3d, N.; 36 m. 4th, N.N.W.; 37m. 7th, W.N.W.; 35 m. 18th., N.N.E.; 36 m. 24th, N.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.69	29.815	45.5	1 P	27.5	12 P	36.5	40.0	33.5	0.3
2	30.08	29.82	30.046	27.5	0 A	10.0	7 A	18.7	17.7	13.0	7.9
3	29.93	29.47	29.706	34.0	3 P	11.0	12 P	22.5	24.5	20.5	0.0
4	30.18	29.91	30.144	15.5	3 P	2.5	7 A	9.0	9.6	6.5	8.4
5	30.15	30.11	30.151	32.0	3 P	9.5	2:30 A	20.7	22.1	19.3	3.9
6	30.14	29.51	29.728	38.5	6 P	26.0	5:30 A	32.3	32.1	31.3	0.0
7	30.20	29.66	29.987	36.0	0 A	1.0	12 P	18.5	17.1	10.3	7.6
8	30.46	30.20	30.451	12.0	4 P	−3.0	7 A	4.5	4.4	1.7	6.0
9	30.64	30.42	30.551	17.0	2 P	9.5	0 A	13.3	13.9	12.7	0.0
10	30.64	30.14	30.413	29.0	12 P	17.0	0 A	23.0	22.5	22.0	0.0
11	30.53	30.14	30.410	33.0	5 P	10.0	12 P	21.5	22.4	16.5	7.9
12	30.54	30.15	30.380	21.0	12 P	0.0	8 A	10.5	13.2	8.3	7.3
13	30.18	30.00	30.146	30.0	3 P	18.0	7 A	24.0	25.0	23.7	0.7
14	30.46	30.18	30.428	30.0	3 P	21.5	7 A	25.7	27.3	23.0	5.0
15	30.40	29.93	30.073	44.0	8 P	27.5	0 A	35.7	34.0	35.7	0.0
16	30.17	29.98	30.131	38.5	0 A	29.0	12 P	33.7	34.1	30.5	0.0
17	30.10	30.04	30.081	34.5	2 P	27.0	7 A	30.7	30.9	28.3	0.0
18	30.65	30.08	30.496	30.0	0 A	6.0	12 P	18.0	18.6	12.5	8.4
19	30.77	30.55	30.683	27.5	3 P	0.5	7 A	14.0	10.6	4.7	8.0
20	30.55	29.82	30.194	33.0	12 P	4.0	3 A	18.5	18.8	19.5	3.0
21	29.82	29.65	29.735	35.5	4 P	32.5	12 P	34.0	33.2	32.7	0.0
22	29.79	29.74	29.791	34.0	3 P	28.0	12 P	31.0	30.8	28.7	0.5
23	30.06	29.78	29.955	28.0	0 A	7.0	12 P	17.5	18.5	14.0	7.5
24	30.12	29.86	30.029	19.5	2 P	6.0	1 A	12.7	13.5	11.3	7.5
25	29.86	29.65	29.702	21.5	11 A	15.5	0 A	18.5	18.3	17.0	0.0
26	29.93	29.65	29.824	33.5	2 P	17.0	6:30 A	25.3	25.2	18.7	7.1
27	29.95	29.83	29.937	36.5	2 P	26.5	0 A	31.5	31.7	29.3	5.5
28	30.07	29.95	30.029	38.0	3 P	28.5	3 A	33.3	32.8	30.5	4.5
29	30.32	30.07	30.240	43.0	2 P	32.0	6 A	37.5	36.0	32.3	3.5
30	30.44	30.32	30.419	40.0	2:30 P	34.5	8 A	37.3	36.5	34.3	0.2
31	30.41	29.94	30.158	38.5	4 P	34.5	4 A	36.5	36.3	35.3	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	26 0	.231	63.5	W.	355	12.0	49	6 P	8:30 P	9:30 P		T
2	9.0	.087	79.5	W.N.W.	441	7.0	37	2 A				
3	8.0	.128	58.5	E.	221	7.0	37	6 P	6 A	1 P		T
4	3.0	.064	83.5	W.N.W.	386	6.5	36	2 A	7 A	8 A		T
5	12.5	.121	72 5	W.	103	0.5	10	3 P				
6	28 5	.180	92.0	N.N W.	72	0 0	—	—	2 A	4 P	.92	1½
7	−2.5	.086	52.5	W.N.W.	399	7.0	37	9 P				
8	−9.5	.054	56.5	N.N.E.	245	4.5	30	1 A	9 P	12 P		T
9	7.5	.085	77.0	N.E.	104	0.0	—	—	0 A	12 P	.02	½
10	19.5	.127	85.5	N.	134	0.0	—	—	0 A	11 P	.60	2
11	11.5	.102	75.5	N.N.W.	232	5.5	33	6 P				
12	3.0	.075	73.5	N.	154	1.5	17	5 A				
13	21.5	.135	87.5	N.E.	61	0.0	—	—	10 A	9 P	T	T
14	17.0	.138	72.5	N.	192	0 0	—	—				
15	33.5	2.30	87.5	S.S.W.	118	0 5	10	9 A	4 A	12 P	.14	½
16	26.0	.185	78.0	N.W.	150	3.0	24	4 A				
17	24.5	.167	82.0	S.S.W.	28	0.0	—	—				
18	7.5	.085	75.0	N.N.E.	300	6.0	35	10 A				
19	−4.0	.062	63.0	N.W.	103	2.0	20	2 A				
20	16.5	.120	87.5	N.	56	0.0	—	—	6 A	12 P	.30	1
21	31.0	.190	95.0	W.	91	0.0	—	—	0 A	2 P	.12	
22	26.0	.165	89.5	N.	73	0.0	—	—	7 A	12 P	.28	2½
23	7 5	.094	69.5	N.N.W.	243	1.5	17	3 P	0 A	9 A		T
24	5.5	.081	73.5	N.	337	6.5	36	11 P				
25	11.5	.103	75.0	N.N.W.	343	5.5	33	1 A	12 M	9 P	.50	5
26	6.0	.125	49.5	N.N.W.	178	2.5	22	3 A				
27	26.5	.170	84.5	S.W.	224	2.5	22	3 P	9 P			T
28	27.5	.180	85.5	S.S.W.	65	0.0	—	—	9 A	1 P		T
29	29.0	.197	83.5	N.N.E.	36	0.0	—	—				
30	32.5	.204	90.5	N.N.E.	34	0.0	—	—	4 P	12 P	.17	
31	33.5	.215	89.0	E.S.E.	76	0.0	—	—	0 A	11 P	1.44	

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1906.

Pressure. In inches.

Maximum reduced to freezing, ... 30.63, Feb. 11th, 11 A.
Minimum reduced to freezing, ... 28.94. Jan. 4th, 12 M.
Maximum reduced to freezing and sea-level, ... 30.95, Feb. 11th, 11 A.
Minimum reduced to freezing and sea-level, ... 29.25, Jan. 4th, 12 M.
Mean reduced to freezing and sea-level, ... 30.051
Annual range, ... 1.70

****Air Temperature.*** In degrees Fahr.

Highest, ... 91.0, Sept. 18th, 3:30 P.
Lowest, ... —7.5, Mar. 24th, 7 A.
Mean, ... 47.3
Mean of means of max. and min., ... 47.6
Mean sensible (wet bulb), ... 42.9
Annual range, ... 98.5
Highest mean daily, ... 77.8, Aug. 23d.
Lowest mean daily, ... 4.4, Dec. 8th.
Mean maximum, ... 58.3
Mean minimum, ... 37.0
Mean daily range, ... 21.3
Greatest daily range, ... 47.5, Mar. 25th
Least daily range, 3.0, May28th, Sept.2d, Dec.21st

Humidity.

Mean dew point, ... 38.6
Mean force of vapor, ...383
Mean relative humidity, ... 77.1

Wind.

Prevailing direction, ... West, Northwest

Summary.

North, Northwest, ... 13 per cent.
North, ... 10 " "
South, ... 12 " "
Northwest, ... 11 " "
Other directions, ... 54 " "
Total movement, ... 53.273 m.
Greatest daily movement, . . . 572 m., Feb. 28th.
Least daily movement, 1 m., Feb. 14th, May 6th.
Mean daily movement, ... 146 m.
Mean hourly velocity, ... 6.1 m.

*Temperature in ground shelter.

T. A. BARRY,
Observer.

Maximum pressure per square foot, 12.0 lbs.=49 m. per hour, Dec. 1st, 6 P., N.N.W.
Maximum velocity for 5 minutes, 36 m. per hour, Apr. 24th, 2 P. N.N.W.; Dec. 1st, 7 P. W.N.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 45.45
Number of days on which .01 or more rain or melted snow fell, ... 121
Snow total in inches, ... 56¼

Weather.

Mean cloudiness observed, ... 50 per cent.
Total cloudiness recorded by Sun Thermometer, ... 1794 hrs.=40 per cent.
Number of clear days, ... 130
Number of fair days, ... 140
Number of cloudy days, ... 95

Bright Sunshine.

Number of hours recorded, 2660 hrs.=60 per cent.

Dates of Frosts.

Last, ... May 20th
First, ... Sept. 25th

Dates of Snow.

Last, ... Apr. 23d
First, ... Nov. 11th
Total days of sleighing, ... 57

Gales of 50 or More Miles Per Hour.

None.

J. E. OSTRANDER,
Meteorologist.

METEOROLOGICAL OBSERVATORY

OF THE

Hatch Experiment Station,

MASSACHUSETTS AGRICULTURAL COLLEGE,

AMHERST.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

BULLETIN No 217. JANUARY, 1907.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.41, 31st, 8 A.;
Minimum reduced to freezing, 29.10, 20th, 1 P.
Reduced† maximum reading, 30.75, 31st, 8 A.;
Reduced† minimum reading, . 29.41, 20th, 1 P.
Mean semi-daily reduced, ... 30.230
Monthly range, ... 1.34

****Air Temperature.*** In Degrees Fahr.

Highest, ... 54.5, 7th, 3 P.
Lowest, ... —23.5, 24th, 7:00 A.
Mean hourly, ... 22.4
Mean of means of max. and min., ... 22.1
Mean sensible (wet bulb), ... 18.8
Monthly range, ... 78.0
Highest mean daily, ... 41.4, 4th
Lowest mean daily, ... —8.0, 24th
Mean maximum, ... 30.9
Mean minimum, ... 13.3
Mean daily range, ... 17.6
Greatest daily range, ... 34.0, 31st,
Least daily range, ... 4.0, 8th

Humidity.

Mean dew point, ... 13.4
Mean force of vapor, ...130
Mean relative humidity, ... 76.1

Precipitation. In inches.

Total precipitation, ... 2.73
Number of days on which .01 inch or more rain or melted snow fell, ... 12
Total snow in inches, ... 16½

Wind.

Total movement, ... 4987 m.
Greatest daily movement, ... 468 m., 20th
Least daily movement, ... 37m., 18th,
Mean daily movement, ... 161 m.
Mean hourly velocity, ... 6.7 m.
Maximum pressure per square foot, 14.0 lbs.= 53 m. per hour, 9th, 10A., W.N.W.
Maximum velocity for 5 minutes, 36 m. per hour 9th, 2 P., W.N.W.
Prevailing Direction, North, Northwest.

Summary.

Northwest, ... 23per cent.
North, Northeast, ... 16 " "
North, Northwest, ... 10 " "
North, ... 10 " "
Other directions, ... 41 " "

Weather.

Mean cloudiness observed, ... 58 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 164 hrs.=56 per cent.
Number of clear days, ... 7
Number of fair days, ... 11
Number of cloudy days, ... 13

Bright Sunshine.

Number of hours recorded, . . 130 hrs.=44%

Rain, 3d, 4th, 7th, 8th, 12th, 14th, 18th, 19th, 20th.

Snow, 8th, 12th, 14th, 17th, 18th, 19th, 22d, 25th, 26th, 30th.

Days Sleighing. 18.

Gales. 35 miles or more per hour, 44 m. 4th, N.N.W.; 53 m. 9th, W.N.W.; 41 m. 20th, N.W.; 37 m. 21st, N.N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.28	29.93	30.123	44.5	1 P	33.0	8 A	38.7	37.6	32.5	5.0
2	30.56	30.28	30.466	44.5	3 P	31.0	12 P	37.7	36.5	32.3	5.6
3	30.62	30.07	30.446	35.0	12 P	27.5	5 A	31.3	31.2	29.3	0.0
4	30.07	29.52	29.766	49.5	12 M	34.0	0 A	41.7	41.4	37.7	0.0
5	30.20	29.96	30.036	44.0	3 P	30.5	5:30 A	37.2	35.1	29.7	6.3
6	30.30	30.15	30.223	42.0	3 P	25.0	7 A	33.5	32.5	28.7	4.6
7	30.18	30.09	30.147	54.5	3 P	30.0	4:30 A	42.3	41.3	38.3	2.0
8	30.28	29.90	30.150	38.0	0 A	34.0	7 A	36.0	35.2	33.7	0.0
9	30.08	29.73	29.877	38.0	10:30 A	15.0	12 P	26.5	28.8	25.3	5.0
10	30.13	29.70	29.933	31.0	12 P	11.5	7 A	21.3	19.7	18.3	7.3
11	30.20	29.67	29.958	40.5	12 M	24.5	12 P	32.5	32.5	27.3	7.5
12	30.23	29.89	30.118	32.0	6 P	22.0	3 A	27.0	27.0	25.0	0.0
13	30.49	30.10	30.411	34.5	3 P	18.0	6:30 A	26.3	26.4	22.0	5.0
14	30.47	29.93	30.194	29.0	3 P	22.5	5 A	25.7	26.3	24.7	0.0
15	30.36	29.90	30.065	37.5	4:30 A	14.5	12 P	26.0	29.8	25.7	2.0
16	30.64	30.36	30.516	16.0	3:30 P	−2.0	12 P	7.0	7.9	4.5	5.6
17	30.65	30.36	30.520	17.0	3 P	−8.0	6 A	4.5	3.4	0.7	0.0
18	30.36	30.17	30.266	25.0	12 P	8.0	0 A	16.5	18.5	17.5	3.0
19	30.01	29.82	30.136	32.5	12 P	24.0	5 A	28.3	28.5	27.0	0.0
20	29.86	29.41	29.630	46.5	2 P	28.5	12 P	37.5	39.3	35.0	0.9
21	30.51	29.86	30.316	28.5	0 A	12.0	12 P	20.3	19.3	14.7	6.6
22	30.50	30.13	30.328	18.0	5 P	8.5	3:30 A	13.3	14.3	12.3	0.0
23	30.53	30.26	30.483	14.5	0 A	−11.0	12 P	1.7	2.4	−3.5	9.1
24	30.56	30.37	30.482	8.0	3 P	−23.5	7 A	−7.7	−8.0	−13.0	9.0
25	30.37	29.98	30.125	10.0	12 P	0.0	0 A	5.0	4.1	3.7	0.0
26	30.33	30.03	30.168	23.0	3 P	11.0	12 P	17.0	14.4	11.5	6.2
27	30.51	30.32	30.425	20.5	4 P	−3.5	7:30 A	8.5	10.8	5.0	7.0
28	30.42	30.30	30.388	26.5	3 P	−3.5	7 A	11.5	13.0	6.0	9.0
29	30.47	30.31	30.402	28.0	3 P	1.0	5 A	14.5	15.3	10.7	7.9
30	30.60	30.29	30.414	29.0	12 M	9.5	12 P	19.3	19.8	15.5	7.8
31	30.75	30.43	30.622	23.0	2 P	−11.0	7 A	6.0	8.8	4.0	8.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	29.0	.204	78.0	N.W.	114	1.0	14	10 P				
2	29.5	.195	83.0	N.W.	185	2.0	20	9 P				
3	26.5	.169	89.0	E.	96	0.0	—	—	11 A	12 P	.32	
4	32.5	.258	73.5	N.W.	311	9.5	44	10 P	0 A	1 P	.18	
5	23.0	.188	67.5	N.W.	214	1.0	14	10 A				
6	25.5	.170	83.5	S.S.W.	93	0.0	—	—				
7	35.5	.256	86.5	W.S.W.	87	0.5	10	6 P	7 P	12 P	.15	
8	31.0	.203	88.0	S.E.	99	0.0	—	—	0 A	1 P	.14	T
9	21.0	.156	78.5	W.N.W.	330	14.0	53	10 A				
10	12.5	.117	71.0	S.W.	322	4.0	28	9 P				
11	22.0	.163	75.5	W.N.W.	302	2.5	22	12 M				
12	22.5	.142	88.0	E.S.E.	101	1.0	14	11 A	8 A	7 P	.17	1.5
13	18.5	.126	81.0	N.E.	129	2.0	20	10 A				
14	22.5	.141	88.0	N.	42	0.0	—	—	6 A	5 P	.27	2
15	18.5	.165	63.5	N.N.E.	216	3.5	26	6 P				
16	−0.5	.058	76.5	N.N.W.	174	3.5	26	11 P				
17	−7.5	.046	70.0	N.N.E.	186	2.0	20	2 A	10 A	4 P	.14	2
18	15.0	.106	87.5	N.E.	37	0.0	—	—	7 A	7 P	T	T
19	24.5	.157	84.0	S.E.	59	0.0	—	—	9 A	12 P	.04	T
20	27.5	.234	68.0	W.	316	8.5	41	10 P	0 A	2 P	.44	
21	2.0	.101	51.0	N.W.	468	7.0	37	11 A				
22	8.5	.083	79.0	N.W.	105	1.5	17	11 P	7 A	7 P	.30	4.5
23	−11.5	.041	62.5	N.N.E.	173	3.0	24	3 A				
24	−37.0	.028	46.0	N.	62	0.0	—	—				
25	−1.5	.056	75.5	N.W.	42	0.0	—	—	6 A	12 P	.33	3.5
26	5.0	.082	69.5	N.N.E.	120	0.0	—	—	0 A	11 A	.25	3.
27	2.0	.063	82.0	N.	203	0.0	—	—				
28	0.0	.068	72.5	N.N.W.	93	1.0	14	3 P				
29	7.0	.082	81.0	W.	104	1.0	14	3 P				
30	14.5	.097	93.0	N.N.W.	121	1.5	17	2 P	4 A	6 A		T
31	−3.5	.066	65.5	N.N.E.	83	0.5	10	2 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during January was more abnormal than would appear from the monthly means. The first half the month had but a single day whose mean temperature was lower than the mean for the month, while the last half had but two days with a mean temperature above the mean for the month. Besides the temperature record the barometric and precepitation records showed abnormal features.

The mean pressure was nearly two-tenths of an inch above the normal, and made a new high record for January at this station. The daily maximum fell below 30 inches on but one date while the daily minimum was above 30 inches on more than half the days. While the fluctuations in pressure were quite pronounced the range for the month was less than usual.

The mean temperature was about a degree below the normal. The maximum over four degress higher and the minimum nearly sixteen degrees lower than usual giving a monthly range about twenty degrees more than normal. The temperature fell below zero on seven dates. The record of—23.5 degrees on the 24th is the lowest since the station was established excepting that of Jan. 5th, 1904 when —26 was reached. The mean hourly record for the 24th was—8.0 degrees, compared with—12.7 degrees on Jan. 5th, 1904.

The total precipitation was about three-fourths the usual amount and was fairly well distributed throughout the month. The snowfall was sufficient to furnish sleighing more than half the month.

The mean dew point was about 5 degrees lower than usual and the relative humidity was about normal.

The total wind movement was about normal although on six dates the daily movement exceeded 300 miles.

The amount of sunshine was nearly normal.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 218. FEBRUARY, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.44, 24th, 1 A.
Minimum reduced to freezing,	29.20, 3d, 1 A.
Reduced† maximum reading,	30.78, 24th, 1 A.
Reduced† minimum reading,	29.51, 3d, 1 P.
Mean semi-daily reduced,	30.094
Monthly range,	1.27

****Air Temperature.*** In Degrees Fahr.

Highest,	43.0, 14th, 3 P.
Lowest,	−18.5, 7th, 7:00 A.
Mean hourly,	16.5
Mean of means of max. and min.,	16.1
Mean sensible (wet bulb),	13.2
Monthly range,	61.5
Highest mean daily,	34.1, 14th
Lowest mean daily,	1.5, 23d
Mean maximum,	26.6
Mean minimum,	5.6
Mean daily range,	21.0
Greatest daily range,	42.0, 7th,
Least daily range,	5.0, 5th

Humidity.

Mean dew point,	9 0
Mean force of vapor,	.096
Mean relative humidity,	80.2

Precipitation. In inches.

Total precipitation,	1.92
Number of days on which .01 inch or more rain or melted snow fell,	10
Total snow in inches,	18.5

Wind.

Total movement,	5272 m.
Greatest daily movement,	529 m., 3d
Least daily movement,	30m., 7th
Mean daily movement,	188 m.
Mean hourly velocity,	7.8 m.

Maximum pressure per square foot, 20.0 lbs.= 63 m. per hour, 3 d, 7 A., N.N.W.

Maximum velocity for 5 minutes, 40 m. per hour 3d, 3 P., N.N.W.

Prevailing Direction, North, Northwest.

Summary.

North, Northwest,	25 per cent.
Northeast,	25 " "
Southwest,	18 " "
Northwest,	11 " "
Other directions,	21 " "

Weather.

Mean cloudiness observed,	41 per cent.
Total cloudiness recorded by the Sun Thermometer,	96 hrs.=32 per cent.
Number of clear days,	14
Number of fair days,	10
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 200 hrs.=68%

Rain, 1st, 3d, 14th, 19th,

Snow, 1st, 4th, 5th, 8th, 9th, 16th, 19th, 20th. 24th, 25th.

Days Sleighing 28.

Gales. 35 miles or more per hour, 63 m. 3d, N.N.W.; 37 m. 5th, N.E.; 39 m. 11th, N. W.; 35 m. 14th. N.N.W.; 37 m. 18th. N.N. E.; 37 m. 21st. N.W.; 48 m. 25th, N.N.W.; 39 m. 27th, N.E.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.43	30.02	30.210	31.5	9 P	17.0	3 A	24.3	25.0	24.7	0.5
2	30.02	29.53	29.738	37.0	3 P	29.0	5 A	33.0	33.1	31.5	6 3
3	30.28	29.51	30.036	39.0	3 A	15.0	12 P	27.0	21.8	14.5	8.3
4	30.45	30.28	30.400	23.0	2 P	10.0	12 P	16.5	14.5	10.3	6.5
5	30.30	29.87	29.993	13.5	3 P	8.5	7:30 A	11.0	10.9	10.0	2.3
6	30.42	30.05	30.224	14.5	2 P	−4.0	12 P	5.3	6.4	3.0	8.0
7	30.58	30.42	30.559	23.5	3 P	−18.5	7 A	2.5	2.7	−2.3	9.0
8	30.44	30.20	30.296	28.0	3 P	4.0	12 P	16.0	12.0	7.7	7.5
9	30.26	30.06	30.173	28.0	4:30 P	-2.0	7 A	13.0	11.6	7.0	8.3
10	30 06	29.52	29.696	35.0	6:30 P	12.0	0 A	23.5	26.0	25.7	0.0
11	29.90	29.54	29.768	33.0	0 A	1.0	12 P	17.0	19.1	12.0	9.1
12	30.24	29.90	30.106	9.5	4 P	−7.0	7 A	1.3	2.5	0.7	9.5
13	30.37	29.97	30.224	21.5	4:30 P	−16.5	7 A	2.5	6.5	2.5	8.6
14	29.97	29.52	29.699	43.0	3 P	20.5	0 A	31.7	34.1	33.5	6.5
15	30.01	29.79	29.970	37.0	5 P	20.0	12 P	28.5	26.2	20.0	8.9
16	29.93	29.83	29.891	35.0	4 P	18.5	0 A	26.7	28.4	25.7	1.0
17	29.89	29 67	29.799	36.0	12 M	17.0	12 P	26.5	26.7	22.7	6.8
18	30.04	29.89	30.027	30.5	3 P	12.5	6 A	21.5	19.7	16.5	9.6
19	30.01	29.57	29.749	25.0	12 P	4.0	5 A	14.5	16.3	15.5	4.0
20	29.83	29.69	29.739	36.5	3 P	25.0	0 A	30.7	30.7	27.5	7.3
21	30.01	29.54	29.775	30.0	0 A	11.0	12 P	20.5	21.6	17.3	8.0
22	30.52	30.01	30.329	15.0	3 P	1.0	7 A	8.0	8.2	5.7	9.7
23	30.77	30.52	30.705	10.0	4 P	−9 0	7 A	0.5	1.5	−0.7	10 0
24	30.78	30.10	30.536	16.0	3 P	−14.0	6:30 A	1.0	3.8	2.7	8.0
25	30.15	29.78	29.907	30.5	9 A	10.0	12 P	20.3	19.4	14 0	9.1
26	30.34	30.14	30.258	19.5	5 P	−4.0	7 A	7.7	8.9	4.7	10.0
27	30.46	30.06	30.288	21.0	3 P	3.0	12 P	12.0	12.1	8.7	9.3
28	30.62	30.42	30.535	22.5	5:30 P	−7.5	7 A	7.5	11.2	8.7	8.9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	22.0	.142	90.5	N.E.	130	0.5	10	10 P	4 A	8 P	.15	1
2	29.0	.185	90.0	S.W.	152	3.0	24	12 P	10 P	12 P	.10	
3	4.5	.098	58.5	N.N.W.	529	20.0	63	7 A				
4	6.0	.076	81.0	N.N.W.	188	3.0	24	0 A	9:30 P	12 P	.14	2
5	7.0	.073	86 5	N.E.	322	7.0	37	9 A	0 A	11 P	.68	8
6	0.5	.053	89.5	N.N.W.	142	0.5	10	2 P				
7	-6.5	.046	79.5	N.E.	30	0.0	—	—				
8	1.0	.070	70.0	N.E.	33	0.0	—	—	8 A	10 A		T
9	4.0	.066	86.0	N.	80	1.0	14	10 A	6 A	1 P	.14	1½
10	23.0	.152	83.0	S.W.	129	4.0	28	11 P				
11	6.5	.082	75.0	N.W.	327	7.5	39	4 P				
12	-4.5	.049	73.0	N.N.W.	251	5.0	32	3 P				
13	-4.5	.063	64.5	S.	125	3.5	26	6 P				
14	31 0	.200	86.0	S.W.	237	6.0	35	11 P	12 M	8 P	.07	
15	16.5	.117	79.5	S.S.W.	229	4.5	30	9 A				
16	23.0	.148	85.5	S.	86	1.0	14	1 A	5 A	6 A		T
17	20.5	.128	87.0	N.N.W.	172	4.5	30	8 P				
18	12.5	.101	78.0	N.N.E.	349	7.0	37	6 A				
19	12.5	.099	86.5	N.E.	34	0.0	—	—	1 P	7:30 P	.16	1
20	24.5	.163	83.5	N.	98	0.5	10	8 P	8 P	11 P	.06	½
21	13.5	.105	81.0	N.W.	274	7.0	37	4 P				
22	0 0	.063	72.5	N.N.W.	250	5.5	33	6 P				
23	-6.0	.046	85.5	N.W.	190	3.5	26	9 A				
24	-0.5	.058	83.5	S.W.	63	0.0	—	—	4:30 P	12 P	.30	3
25	10.0	.090	80.0	N.N.W.	315	11.5	48	10 A	0 A	5 A	.12	1½
26	-1.0	.060	72.5	N.E.	114	1.0	14	3 A				
27	5.0	.071	81.5	N.E.	210	7.5	39	11 A				
28	3.5	.078	77.5	S.W.	213	1.0	14	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The severe cold weather which began about the middle of January continued throughout the whole of February. The month proved to be the coldest February since the station was established and January 1904 is the only month on our records showing a lower mean temperature.

The mean temperature was more than seven degrees below the normal. The maximum and minimum temperatures were both nearly ten degrees lower than usual. The minimum was the lowest February record excepting that of 1898. On nine dates the maximum was above freezing and on nine dates the minimum was below zero. On but two dates was the mean hourly record above 32 degrees.

The mean baromerer was slightly higher than the normal. The maximum and minimum were both high and the range was considerably less than usual.

The total wind movement was about ten per cent more than usual and an unusually large amount was from northerly directions. The record on the 3d of 529 miles is exceptional for this location. A large number of gales were noted.

The mean dew point was lower than any previous monthly record of the station. The relative humidity was slightly above the normal.

The total precipitation was about 60 per cent of the normal, nearly all of it occurring as snow.

The amount of sunshine recorded was more than for any previous February.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 219. MARCH, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.27, 1st, 9 A.
Minimum reduced to freezing,	28.89, 20th, 3 A.
Reduced† maximum reading,	30.59, 1st, 9 A.
Reduced† minimum reading,	29.20, 20th 3 A.
Mean semi-daily reduced,	30.079
Monthly range,	1.39

****Air Temperature.*** In Degrees Fahr.

Highest,	79.5, 29th, 4 P.
Lowest,	5.5, 1st, 7 A.
Mean hourly,	35.2
Mean of means of max. and min.,	35.2
Mean sensible (wet bulb),	30.9
Monthly range,	74.0
Highest mean daily,	61.3, 29th
Lowest mean daily,	19.6, 1st
Mean maximum,	44.9
Mean minimum,	25.4
Mean daily range,	19.5
Greatest daily range,	34.0, 29th
Least daily range,	6.5, 13th

Humidity.

Mean dew point,	25.8
Mean force of vapor,	.211
Mean relative humidity,	73.4

Precipitation. In inches.

Total precipitation,	1.82
Number of days on which .01 inch or more rain or melted snow fell,	9
Total snow in inches,	3
Snow on ground at end of month,	none

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5718 m.
Greatest daily movement,	523 m., 20th
Least daily movement,	52m., 8th
Mean daily movement,	186 m.
Mean hourly velocity,	7.8 m.

Maximum pressure per square foot, 27.0 lbs.= 74 m. per hour, 20th, 3 A., W.N.W.

Maximum velocity for 5 minutes, 44 m. per hour 20th, 3 A., W.N.W.

Prevailing Direction, West.

Summary.

North, Northwest,	16 per cent.
Northwest,	16 " "
South southwest,	13 " "
West northwest,	10 " "
Other directions,	45 " "

Weather.

Mean cloudiness observed,	44 per cent.
Total cloudiness recorded by the Sun Thermometer,	126 hrs.=34 per cent.
Number of clear days,	14
Number of fair days,	11
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 245 hrs.=66%

Rain, 2d, 4th, 12th, 13th, 14th, 15th, 19th, 20th, 23d, 24th, 27th, 28th.

Snow. 4th, 8th, 10th, 15th, 19th, 24th, 25th.

Days Sleighing, 12.

Gales, 35 miles or more per hour, 43 m. 3d, N.W.; 40 m. 6th, N.E.; 36 m. 16th, W.N.W.; 74 m. 20th, W.N.W.

Sleet, 12th, 19th, 24th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.59	30.17	30.453	33.0	4 P	5.5	7 A	19.3	19.6	18.7	9.5
2	30.17	29.44	29.579	38.5	7 P	26.0	0 A	32.3	32.0	32.7	2.1
3	29.88	29.68	29.739	36.0	3 P	24.0	12 P	30.0	31.5	27.3	8.0
4	30.11	29.88	30.058	32.5	3 P	22.5	4 A	27.5	26.5	23.7	6.3
5	30.10	29.86	29.985	31.0	4 P	11.5	6:30 A	21.3	23.5	19.5	10.2
6	30.30	29.85	30.128	30.5	2 P	17.0	12 P	23.7	23 2	20.5	10.3
7	30.35	30.08	30.231	37.0	4 P	8.0	6 A	22.5	20.9	18.3	10.0
8	30.08	29.87	29.976	32.0	4 P	16.0	2 A	24.0	23.0	20.3	6.5
9	30.42	30.08	30.320	34.0	5 P	13.5	6:30 A	23.7	24.9	20.7	10.0
10	30 47	30.24	30.350	26.0	1:30 P	15.0	6 A	20.5	22.3	20.3	6.5
11	30.31	30.22	30.289	42.5	5 P	17.0	6 A	29.7	29.1	24.3	10.8
12	30.33	29.99	30.201	39.0	2 P	12.0	7 A	25.5	28.5	22.0	7.0
13	29.99	29.67	29.785	40.5	6 P	34.0	6 A	37.3	36.6	35.7	3.3
14	30.00	29.62	29.839	42.5	6 P	33 0	2 A	37.7	35.7	34 0	2.1
15	30.24	30.00	30.186	43.0	5 P	28.5	7 A	35.7	35.9	31.0	10.7
16	30.54	30.24	30 481	46 0	3 P	28.0	6:30 A	37.0	36.0	28.7	11.3
17	39.48	30 04	30.193	52.0	0:30 P	31.5	1 A	41.7	42.6	38.0	7.0
18	30.37	30.19	30.330	49 0	4 P	29 5	6:30 A	39.3	38.2	31.0	11.0
19	30.39	29.24	29.983	34.0	11 A	24.0	6 A	29.0	30.6	28.0	0.5
20	30.04	29.20	29 709	37.5	4 P	27.0	12 P	32.3	34.0	28.7	9.5
21	30.16	29.94	30.063	51.0	4 P	20.5	6 A	35.7	35.5	30.0	11.2
22	29.97	29.69	29 796	56.0	4:30 P	34.0	0 A	45.0	43.4	39.3	5.6
23	30.14	29 72	29.952	66.0	3 P	36 5	3 A	51.3	52.5	43.0	9.9
24	30.25	29.88	30.043	44 0	8:30 A	29.0	12 P	36.5	37.0	34.0	0.0
25	30.42	30 25	30.383	47.0	5 P	20.0	6 A	33.5	34.1	28 0	11.8
26	30.28	30 00	30.113	53.0	1:30 P	27.5	5 A	40.3	39.8	35.5	7.0
27	30.18	30.02	30.115	59.5	4:30 P	33.0	3 A	46.3	46.5	43.0	9.5
28	30.07	29.87	29.953	58.5	3:30 P	38.0	7 A	48.3	48.5	45.5	6.5
29	29.97	29 83	29.919	79.5	4 P	45.5	3:30 A	62.5	61.3	53.7	10.8
30	30.20	29.86	30 059	66 0	3:30 P	44.0	6:30 A	55.0	53.8	45 5	11.3
31	30.25	30.15	30.235	55.0	3 P	37.0	6 A	46 0	45.0	38.0	8.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	17.0	.110	90.5	N.W.	80	0.0	—	—				
2	31.5	.193	93.0	N.W.	107	5.5	33	7 P	2 A	12 M	.20	
3	22.0	.164	75.5	N.N.W.	280	9.0	43	3 A				
4	20.0	.136	82.0	N.	159	1.0	14	9 A	6 A	6 P	.08	½
5	16.5	.114	82 5	N.N.W.	121	2.0	20	12 M				
6	15.5	.122	77.0	N.N.E.	351	8.0	40	9 A				
7	13.5	.110	75.0	E.S.E.	118	1.5	17	11 A				
8	17.0	.121	83.0	N.N.E.	52	0.0	—	—	6 A	11 A	.04	½
9	16.0	.121	77.0	W.	146	3.0	24	10 A				
10	14.5	.121	73.5	N.W.	76	0.0	—	—	12 M	10 P		T
11	18.5	.146	71.5	N.N.W.	238	4.5	30	11 A				
12	19.0	.120	63.5	S.W.	146	3 5	26	9 P	9 P	12 P	T	
13	34.5	.214	95.5	W.S.W.	158	2.0	20	0 A	0 A	11 A	.30	
14	31.5	.202	90.5	W.N.W.	78	4 0	28	8 P	3 A	3 P	.38	
15	22.5	.210	59.5	W.N.W.	240	2.5	22	11 A	9 P	11 P	T	T
16	22.0	.191	63.5	S.S.W.	265	6.5	36	3 A				
17	31.0	.279	63.5	W.S.W.	376	4.5	30	9 P				
18	23.5	.201	65.0	N.N.W.	223	1.5	17	12 P				
19	23.5	.167	78.0	S.S.W.	184	4.0	28	5 P	11 A	12 P	.34	T
20	21.0	.189	61.5	W.N.W.	523	27.0	74	3 A	8 A		T	
21	21.5	.197	61.5	S.S.W.	218	1.5	17	8 P				
22	35 0	.273	76.5	S.	121	0.5	10	9 A				
23	32.0	.372	45.5	N.W.	234	5.5	33	5 P	11 P	12 P	T	
24	28.5	.225	76.5	S.E.	194	3.5	26	9 P	0 A	12 P	.36	2
25	20.0	.181	60.5	W.	166	2.5	22	0 A	0 A	1 A		T
26	30.0	.239	70.5	S.W.	232	2.5	22	6 A				
27	39.0	.312	78.0	S.	91	0.5	10	3 P	10 P	12 P	.02	
28	43.5	.326	90.0	S.E.	75	0.0	—	—	0 A	11:30 A	.10	
29	50 0	.498	74.5	S.S.W.	108	2.0	20	0 A				
30	38.5	.396	59.5	N.W.	248	2.5	22	10 A				
31	30.5	.278	62.0	N.N.W.	110	1.0	14	8 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during March was an agreeable contrast with that of the preceding month. No zero weather occurred, the amount of sunshine was large, the snow on the ground gradually disappeared and when the month closed much of the frost had left the ground and the roads were drying in many places. The last week of the month was especially mild and pleasant.

The mean barometer was slightly above the normal and the range about the usual amount. The fluctuations were large and the minimum record was coincident with the maximum wind pressure of the month. The wind movement at that time was unusually large.

The mean temperature was nearly two degrees above the normal; the maximum record of 79.5 degrees was 2.5 degrees higher than any previous March record and nearly 20 degrees above the mean of the March maximums at this station. The minimum was nearly normal giving an extremely large range for the month.

The mean dew point and relative humidity were both practically normal.

The total precipitation was very small being only about two-fifths of the usual amount. It was well distributed throughout the month.

The total wind movement was slightly more than usual and the number of gales was small for March. The amount of cloudiness was considerably less than usual. Sleighing for light sleighs continued until the 13th.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 220. APRIL, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.11, 27th, 8 P.
Minimum reduced to freezing,	28.68, 9th, 12 P.
Reduced† maximum reading,	30.41, 27th, 8 P.
Reduced† minimum reading,	28.29, 9th 12 P.
Mean semi-daily reduced,	29.885
Monthly range,	1.42

****Air Temperature.*** In Degrees Fahr.

Highest,	70.5, 30th, 3 P.
Lowest,	20.5, 3d, 6 A.
Mean hourly,	41.5
Mean of means of max. and min.,	41.7
Mean sensible (wet bulb),	37.1
Monthly range,	49.0
Highest mean daily,	60.5, 30th
Lowest mean daily,	31.5, 9th
Mean maximum,	52.1
Mean minimum,	31.4
Mean daily range,	20.7
Greatest daily range,	39.0, 4th
Least daily range,	6.0, 8th, 9th

Humidity.

Mean dew point,	32.0
Mean force of vapor,	.261
Mean relative humidity,	74.1

Precipitation. In inches.

Total precipitation,	1.98
Number of days on which .01 inch or more rain or melted snow fell,	8
Total snow in inches,	8

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	7096 m.
Greatest daily movement,	433 m., 6th
Least daily movement,	59m., 12th
Mean daily movement,	236 m.
Mean hourly velocity,	9 8 m.

Maximum pressure per square foot, 12.0 lbs.= 49 m. per hour, 24th, 4 P., N.

Maximum velocity for 5 minutes, 36 m. per hour 24th, 4 P., N.

Prevailing Direction, Northwest.

Summary.

North,	17 per cent.
North northwest,	17 " "
Southwest,	17 " "
West northwest,	17 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	53per cent.
Total cloudiness recorded by the Sun Thermometer.	134hrs.=34 per cent.
Number of clear days,	12
Number of fair days.	11
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded. . . 268 hrs.=66%

Rain, 5th. 8th, 16th, 19th. 23d. 24th, 26th, 28th. 29th, 30th.

Snow, 8th. 9th, 10th, 19th, 20th.

Gales, 35 miles or more per hour, 35 m. 2d, N.N.E.; 42 m. 6th, N.N.W.; 44 m. 20th, N.W.; 35 m. 21st, N.W. 40 m. 22d, W.; 49m. 24th, N.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.25	30.15	30.216	39.0	0 A	28.0	12 P	33.5	32.4	29.7	1.8
2	30.23	30.13	30.198	44.0	3 P	24.5	4 A	34.3	32.6	26.7	11 2
3	30.19	30.03	30.129	55.5	3 P	20.5	6 A	38.0	37.5	33.0	11.9
4	30.15	29.89	30.031	65.0	2:30 P	26.0	6 A	45.5	45.4	37.3	10.2
5	29.99	29 66	29.798	57.5	2 P	29.0	12 P	43.3	44.4	38.0	4.8
6	30.27	29.99	30.219	45.0	4 P	25.0	6 A	35.0	33 5	28.0	12.3
7	30.25	30.06	30.179	48.0	2 P	22.0	6 A	35.0	35.0	30.3	10.0
8	30.06	29.62	29.726	36.0	3 P	30.0	12 P	33.0	32 4	31.3	4.5
9	29.64	28.99	29.207	34.0	12 M	28.0	4 A	31.0	31.5	30.3	5.0
10	29.41	28.99	29.221	41.0	12 M	30.5	6 A	35.7	33.5	29.5	8.3
11	29.73	29.41	29.620	48.5	5 P	29.5	5:30 A	39.0	38.2	34.3	11.6
12	29.79	29.62	29.725	51.5	2 P	25.0	5 A	38.3	39.5	36.0	12.2
13	29 62	29.49	29.527	42.0	3 P	33.0	12 P	37.5	37.9	36.0	7.0
14	29.76	29.46	29.620	51.0	11 A	33.0	0 A	42.0	41.7	36.7	11.3
15	29.85	29.76	29.827	48.0	1 P	31.0	6 A	39.5	38.7	33.5	12.0
16	29.85	29.57	29.717	52.5	4 P	27.0	6 A	39.7	41.6	37.7	11.5
17	29.85	29.53	29.637	47.0	0:30 P	33.0	5:30 A	40.0	38.9	34.7	7.3
18	29.95	29.84	29.926	48.0	2 P	29.5	5 A	38.7	39.1	35.0	12.3
19	29.95	29.77	29.848	41.0	11:30 A	27.0	6 A	34.0	34.3	33.7	3.8
20	30.04	29.83	29.952	44.0	2 P	30.0	12 P	37.0	35.8	32.3	12.5
21	30.16	30.04	30.128	48.0	4 P	23.5	6 A	35.7	37.9	33.3	12.5
22	30.16	29.95	30.070	63.0	4 P	29 5	5:30 A	46.3	48.2	39.3	11.5
23	30.00	29 42	29.758	63.0	2 P	42.0	6 A	52.5	51.8	47.3	7.4
24	29 94	29.18	29.577	56.5	4 P	41.0	12 P	48.7	49 7	47.0	10.8
25	30.03	29 78	29.903	69.5	3 P	34.0	5:30 A	51.7	53.7	46.0	11.0
26	30.13	29 89	30.022	67.0	1:30 P	45.0	5 A	56.0	52.2	46.5	5 0
27	30.41	30.13	30.384	60.0	4 P	38.5	6 A	49.3	48.5	41.5	11.0
28	30.38	30.23	30.300	61.0	12 M	29.5	6 A	45.3	45.8	43.5	7.4
29	30.24	30.06	30.156	66.5	4 P	45.0	5 A	55.7	54.0	51.5	4 6
30	30.10	29.84	29 938	70.5	3 P	53.0	3 A	61.7	60 5	55 3	5.6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	27.5	.171	90.0	N.N.E.	265	4.0	28	6 P				
2	19.0	.168	63.0	N.N.E.	408	6.0	35	11 A				
3	26.5	.217	68.5	N.N.W.	90	1.0	14	4 P				
4	30.5	.276	67.0	S.W.	142	3.5	26	7 P				
5	34.5	.254	80 5	W.N.W.	276	4.0	28	5 P	2 A	8 A	.18	
6	20.5	.177	65.0	N.N.W.	433	8.0	42	11 A				
7	22.5	.197	62.5	E.	185	2.0	20	2 P				
8	29.0	.181	90.0	N.E.	176	2.0	20	10 P	6 A	8 P	.40	2½
9	27.0	.179	84.5	N.	312	3.0	24	5 P	10 A	12 P	.50	4
10	24.5	.177	77.5	N.N.W.	140	0.5	10	9 P	0 A	11 P	.23	1½
11	28.0	.227	69.5	N.N.W.	207	3.5	26	11 A				
12	31.0	.239	73.0	N.	59	0.0	—	—				
13	33.0	.225	85.0	N.	184	2.5	22	10 A				
14	31.0	.254	71.0	N.W.	258	4.0	28	11 A				
15	25.0	.232	59.5	W.N.W.	318	3.0	24	1 P				
16	31.0	.267	67.0	W.S.W.	151	4.5	30	12 P	8 P	11:30 P	.03	
17	31.5	.216	82.0	W.N.W.	271	4.5	30	0 A				
18	29.5	.230	72.5	W.N.W.	214	4.0	28	5 P				
19	32.0	.200	92.5	W.N.W.	63	0.0	—	—	11 A	5 P	.02	T
20	25.5	.212	66.0	N.W.	350	9.5	44	12 M	10:30 A			T
21	26.0	.225	64.5	N.N.W.	341	6.0	35	1 P				
22	29.0	.316	51.0	W.	308	8.0	40	3 P				
23	44.0	.363	81.5	S.W.	204	3 0	24	4 P	12 M	12 P	.18	
24	43.0	.364	78.5	N.	425	12.0	49	4 P	0 A	11 A	.44	
25	37.0	.417	54.5	S.W.	296	5.0	32	1 P				
26	44.0	.346	84.5	N.	164	4.5	30	5 P	6 A	8 P	T	
27	35.0	.298	71.0	S.E.	240	4.0	28	5 A				
28	40 0	.318	77.5	S.W.	125	1.5	17	2 P	2 P	5 P	T	
29	49.5	.425	87.0	S.W.	129	2.5	22	3 P	4 A	9 A	T	
30	53 0	.479	86.0	S.S.W.	362	5.0	32	3 P	10 P		T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The prospect of an early spring which the weather the latter part of March indicated, was materially changed by the weather during April. Low temperature and snow so delayed the progress of the season that the month closed with the season from one to two weeks backward.

Most of the weather elements showed abnormal conditions to a greater or less degree; those of temperature, precipitation and wind movement being the most noticeable.

The mean barometer was about one-tenth of an inch below the normal, giving a very unusual record for April. The minimum record was unusually low for this station. The total wind movement was about 40 per cent more than the normal and the large amount from the northwest quadrant had a considerable effect on the temperature for the month. On half the days of the month the daily movement exceeded 240 miles.

The mean temperature was more than four degrees below the normal and the maximum for the month was nine degrees lower than the March maximum. The minimum for the month was nearly normal giving a range considerably less than usual.

The mean dew point was three degrees lower than usual and the relative humidity about eight per cent higher.

The total precipitation was only about two-thirds the normal, more than half of it falling as snow. A total snowfall of eight inches was a very unusual feature for April. The amount of sunshine recorded was very large.

J. E. OSTRANDER Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 221. MAY, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.04, 2d, 9 A.
Minimum reduced to freezing,	29.37, 27th, 5 P.
Reduced† maximum reading,	30.34, 2d, 9 A.
Reduced† minimum reading,	29.67, 27th 5 P.
Mean semi-daily reduced,	29.996
Monthly range,	0.67

****Air Temperature.*** In Degrees Fahr.

Highest,	90.0, 14th, 2 P.
Lowest,	25.0, 12th, 4:30 A.
Mean hourly,	51.8
Mean of means of max. and min.,	51.7
Mean sensible (wet bulb),	46.8
Monthly range,	65.0
Highest mean daily,	66.1, 19th
Lowest mean daily,	40.2, 4th
Mean maximum,	62.6
Mean minimum,	40.8
Mean daily range,	21.6
Greatest daily range,	43.0, 14th
Least daily range,	7.5, 26th, 27th

Humidity.

Mean dew point,	42.2
Mean force of vapor,	.379
Mean relative humidity,	75.3

Precipitation. In inches.

Total precipitation,	4.02
Number of days on which .01 inch or more rain or melted snow fell,	11
Total snow in inches,	trace

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5946 m.
Greatest daily movement,	400 m., 13th
Least daily movement,	82m., 8th, 9th
Mean daily movement,	191 m.
Mean hourly velocity,	7.9 m.
Maximum pressure per square foot, 6.5 lbs.= 36 m. per hour, 4th, 5 P., W.N.W.	
Maximum velocity for 5 minutes, 24 m. per hour 10th, 2 P., W.	
Prevailing Direction, West Southwest.	

Summary.

South,	16 per cent.
North northwest,	13 " "
Southwest,	10 " "
West northwest,	13 " "
West southwest	13 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	68 per cent.
Total cloudiness recorded by the Sun Thermometer,	244hrs.=54 per cent.
Number of clear days,	2
Number of fair days,	17
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 209 hrs.=46%

Rain, 4th, 6th, 7th, 8th, 9th, 11th, 16th, 17th, 19th, 22d, 24th, 26th, 27th, 29th, 31st.

Snow, 11th.

Frosts, 5th, 22d.

Gales, 35 miles or more per hour, 36 m. 4th, W.N.W.

Thunder and Lightning, 16th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.21	29.85	30.077	60.5	1 P	42.0	12 P	51.3	54.1	47.7	8.7
2	30.34	30.21	30.300	62.0	4 P	40.0	2 A	51.0	49.2	43.3	8 2
3	30.29	30.13	30.233	57.0	5 P	39.0	4 A	48.0	46.7	41.0	7.6
4	30.20	29.78	29.995	48.5	4 P	36.5	12 P	42.5	40.2	36.7	1.2
5	30.30	30.20	30.257	57.5	3 P	30.0	5 A	43.7	45.6	38.0	12.2
6	30.22	29.99	30.070	50.0	2 P	39.0	3 A	44.5	45.6	42.7	0.0
7	29.99	29.87	29.944	60.0	12 M	45.5	5 A	52.7	52.7	50.0	3.1
8	30.06	29.94	30.025	69.5	3:30 P	47.0	6 A	58.3	54.9	51.3	7.8
9	30.03	29.83	29.904	56.0	5 P	44.0	12 P	50.0	50.7	46.5	0.0
10	29.83	29.75	29.741	64.0	10:30 A	41.0	3 A	52.5	51.8	47.3	7.4
11	30.03	29.71	29.825	49.0	2 P	36.0	7 A	42.5	40.3	34.5	3.0
12	30.18	30.03	30.121	57.0	2:30 P	25.0	4:30 A	41.0	43.7	37.7	11.5
13	30.10	29.79	29.947	75.0	1 P	36.0	3 A	55.5	56.7	52.3	11.8
14	30.16	29.85	29.986	90.0	2 P	47.0	5 A	68.5	62.8	52.0	11.5
15	30.18	30.00	30.107	74.5	3 P	43.5	4:30 A	59.0	60.0	54.7	11.5
16	30.00	29.85	29.895	65.0	3 P	55.0	12 P	60.0	60.5	58.3	4.0
17	30.04	29.91	30.008	64.0	2:30 P	49.0	12 P	56.5	56.0	51.3	2.3
18	29.98	29.75	29.869	76.0	4:30 P	43.0	4 A	59.5	61.9	57.0	11.0
19	29.88	29.70	29.832	79.5	1:30 P	55.5	5:30 A.	67.5	66.1	60.5	7.0
20	29.92	29.77	29.832	62.5	9:30 A	42.0	12 P	52.3	53.7	47.5	10.0
21	30.06	29.92	30.010	57.0	3 P	36.0	4 A	46.5	44.7	38.5	9.5
22	30.10	30.00	30.069	59.0	4 P	30 5	5 A	44.7	48.0	46.7	9.2
23	30.14	30.02	30.091	66.0	4:30 P	40.0	3 A	53.0	52.0	47.3	7.0
24	30.14	30.00	30.078	70.0	1 P	36.0	5 A	53.0	54.8	50.7	8.0
25	30.25	30.09	30.196	66.0	4:30 P	36.0	4:30 A	51.0	52.6	43.0	11.6
26	30.13	29.87	30.021	50.5	11 A	43.0	4 A	46.7	45.9	44.3	0.0
27	29.87	29.67	29.761	52.0	2 P	44.5	4 A	48.3	48.5	46.7	0.0
28	29.86	29.73	29.833	50.5	5 P	40.5	4:30 A	45.5	44.6	37.7	3.8
29	29.84	29.75	29.833	63.0	4 P	38.5	5 A	50.7	51.0	45.3	11.8
30	30.04	29.83	29 938	67.0	3 P	39.0	4 A	53.0	56.6	50.7	5.8
31	30.10	30.04	30.095	64.0	4:30 P	45.0	12 P	54.5	54.3	51.0	2.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	38.5	.316	75.5	N.N.W.	284	4.0	28	3 P				
2	38.5	.327	71.5	S.E.	181	2.5	22	2 A				
3	35.0	.286	71.5	S.	146	2.5	22	10 P				
4	34.5	.231	87.5	W.N.W.	189	6.5	36	5 P	5 A	2 P	.48	
5	28.0	.293	55 0	W.	238	3.0	24	9 A				
6	40.0	.295	85.0	S.	152	2.0	20	7 A	6 A	12 P	.17	
7	48.0	.386	89.0	E.N.E.	88	0.0	—	—	0 A	12 P	.02	
8	47.5	.404	78.0	N.	82	2.0	20	12 M	0 A	7 A	.04	
9	44.5	.338	87.5	E.	82	0.0	—	—	4 A	9 A	.12	
10	45.5	.348	88.0	W.	242	5.5	33	3 P				
11	29.5	.221	76.0	W.N.W.	332	3.5	26	4 P	8 A		T	T
12	30.0	.283	59.0	S.W.	153	1.0	14	3 P				
13	49.0	.453	76.5	S.	400	5.0	32	2 P				
14	45.0	.499	62.0	E.	162	2.5	22	6 P				
15	51.0	.500	76.0	S.	191	4.0	28	7 P				
16	57.5	.498	95.5	N.W.	217	1.5	17	3 A	7:30 A	12 P	2.14	
17	49.0	.415	84.5	S.	103	0.0	—	—	0 A	3 A	.14	
18	53.0	.568	73.0	S.S.W.	147	1.5	17	12 M				
19	58.5	.593	84.5	S.W.	180	2.0	20	1 P	5:30 P		T	
20	42.0	.398	68.0	W.N.W.	248	4.5	30	1 P				
21	31.5	.282	62.5	W.N.W.	308	3.5	26	6 P				
22	43.5	.360	80.0	W.S.W.	198	3.5	26	1 P	4 P		T	
23	44.0	.468	80.5	S.W.	86	0.5	10	3 P				
24	45.5	.447	71.5	W.S.W.	109	1.5	17	3 P	3 P	4 P	T	
25	31.0	.386	47.0	S.S.W.	152	2.0	20	6 P				
26	41.5	.320	82.5	S.S.E.	184	1.0	14	10 A	8 A	12 P	.25	
27	45.0	.340	87.5	N.	87	2.0	20	11 P	0 A	12 P	.62	
28	28 0	.282	57.5	N.N.W.	353	5.0	32	2 P				
29	40.5	.366	70.5	N.N.W.	351	4.0	28	3 P	1 A	3 A	.01	
30	44.5	.475	62.0	N.N.W.	193	3.0	24	10 A				
31	49.0	.398	90.5	W.S.W.	108	0.5	10	4 P	1 A	7 P	.03	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during May was more unseasonable than that of April, and at the close of the month the season was from two to three weeks later than usual. The slow progress of spring was principally due to low temperature and a deficiency of sunshine.

The mean barometer was slightly higher than the normal and the range less than usual. The fluctuations of pressure were generally small and rather slow.

The mean temperature was more than five degrees lower than the normal, and the maximum was over three degrees higher and the minimum five degrees lower than usual, giving an extremely large range for the month. The minimum fell below the freezing point on but three dates and moderate frosts were noted on but two dates. The interval between the minimum and maximum records of the month was less than two and one-half days.

The total precipitation was about ten per cent more than the normal and more than half of the amount fell on a single date. It was accompanied by thunder and lightning,—the only thunderstorm of the month.

The mean dew point was over five degrees below the normal and the relative humidity considerably higher than usual.

The total wind movement was about a third more than usual and the amount of cloudiness large. These two features undoubtedly materially reduced the damage from frosts.

J. E. OSTRANDER Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 222. JUNE, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.94, 23d, 9 A.
Minimum reduced to freezing,	29.21, 3d, 5 A.
Reduced† maximum reading,	30.22, 23d, 9 A.
Reduced† minimum reading,	29.51, 3d, 5 A.
Mean semi-daily reduced,	29.932
Monthly range,	0.71

****Air Temperature.*** In Degrees Fahr.

Highest,	95.0, 18th, 3 P.
Lowest,	38.0, 1st, 3 A., 4th, 5 A.
Mean hourly,	63.9
Mean of means of max. and min.,	63.7
Mean sensible (wet bulb),	58.3
Monthly range,	57.0
Highest mean daily,	77.3, 18th
Lowest mean daily,	45.8, 2d
Mean maximum,	75.9
Mean minimum,	51.5
Mean daily range,	24.4
Greatest daily range,	40.5, 16th
Least daily range,	2.0, 2d

Humidity.

Mean dew point,	55.0
Mean force of vapor,	.592
Mean relative humidity,	76.9

Precipitation. In inches.

Total precipitation,	2.36
Number of days on which .01 inch or more rain or melted snow fell,	9

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4223 m.
Greatest daily movement,	329 m., 3d
Least daily movement,	56m., 22d
Mean daily movement,	141 m.
Mean hourly velocity,	5.9 m.
Maximum pressure per square foot, 6.0 lbs.= 35 m. per hour, 3d, 3 P., N.N.W.; 27th, 11 A. W.N.W.	
Maximum velocity for 5 minutes, 30 m. per hour 27th, 1 P., W.	
Prevailing Direction, South Southwest.	

Summary.

South,	10 per cent.
North northwest,	10 " "
South Southwest,	10 " "
West,	10 " "
South southeast	23 " "
Other directions,	37 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	240hrs.=53 per cent.
Number of clear days,	1
Number of fair days,	20
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, . . 217 hrs.=47%

Rain, 2d, 3d, 5th, 6th, 9th, 10th, 14th, 19th, 20th, 25th, 26th, 29th, 30th.

Gales, 35 miles or more per hour, 35 m. 3d, N.N.W.; 35m. 27th, W.N.W.

Thunder and Lightning, 20th, 23d, 25th, 26th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.11	29.91	30.035	68.0	1:30 P	38.0	3 A	53.0	54.3	51.3	7.2
2	29.94	29.59	29.759	46.0	1 P	44.0	5 A	45.0	45.8	44.5	0.0
3	29.85	29.51	29.691	58.0	6 P	44.5	3 A	51.3	50.9	49.3	0.0
4	29.95	29.85	29.930	72.0	12 M	38.0	5 A	55.0	58.5	55.5	6 6
5	29.94	29.65	29.760	55.0	3 P	48.0	8 A	51.5	51.9	49.5	0.0
6	29.81	29.65	29.720	62.0	12 M	48.0	3 A	55.0	54 0	50.5	1.8
7	29.95	29.81	29.893	65.0	3 P	49.0	4 A	57.0	57.1	54.3	6.8
8	29.94	29.84	29.922	74.5	3:30 P	40.5	5 A	57.5	59.7	57.3	10.0
9	30.01	29.90	29 963	68.5	3 P	43.0	5 A	55.7	56.8	54.0	8.5
10	30.10	30.01	30.078	62.0	4:30 P	48.5	1 A	55.3	55.0	50.0	3.3
11	30.08	29.97	30.027	70.0	4 P	49.0	5 A	59.5	58.2	51.5	6.2
12	30.13	30.04	30.115	76.0	3 P	41.5	5 A	58.7	60 7	54.0	11.6
13	30.13	29.96	30.032	77.5	2 P	42.0	5 A	59.7	60.7	53.5	9.0
14	29.96	29.69	29.793	68.0	4 P	47.5	4 A	57.7	59.2	53.5	5.0
15	29.96	29.68	29.790	79.5	3 P	50.0	5 A	64.7	65.8	58.0	10.0
16	30.10	29.96	30.038	84.5	3 P	44.0	5 A	64.3	66.8	60.5	10.6
17	30.17	30.10	30.146	85.5	1 P	53.5	5:30 A	69.5	70.3	61.5	6.0
18	30.12	29.97	30.056	95.0	3 P	62.0	5:30 A	78.5	77.3	65.0	11.5
19	30.04	29.94	30.000	81.0	3 P	59.0	7 A	70.0	69.5	61.5	5.4
20	30.00	29.91	29.968	80.0	3:30 P	61.0	3 A	70.5	70.6	65.7	7.3
21	30.14	29.99	30.078	87.0	3 P	61.0	12 P	74.0	73.7	67.3	10.3
22	30.19	30.12	30.178	91.5	4 P	54.5	5 A	73.0	73.3	66.3	10.5
23	30.22	30.08	30.152	89.0	2:30 P	59.5	5 A	74.3	74.6	67.3	8.7
24	30.12	29.96	30.026	88.0	3 P	60.0	5 A	74.0	73.4	64.3	9.5
25	29.99	29.79	29 879	92.0	3 P	66.5	3 P	79.3	76.9	69.7	8.3
26	29.84	29.59	29.685	92.5	1:30 P	64.0	12 P	78.3	75.4	70.5	8.2
27	29.84	29 62	29.735	71.5	4 P	55.5	3:30 A	63.5	63.6	56.0	6.0
28	29.95	29.84	29.917	86.0	4 P	57.0	5 A	71.5	71.3	64.0	14.0
29	29.96	29.71	29.933	80.0	2:30 P	58.0	3 A	69.0	67.7	63.3	8.5
30	29.81	29.59	29.668	72.0	1 P	57.5	3 P	64 7	64.3	59.0	6.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	48.5	.419	83.5	S.E.	98	1.0	14	2 P				
2	43.0	.308	90.5	N.E.	154	2.0	20	9 P	5:30 A	12 P	.58	
3	47.5	.373	88.5	N.N.W.	329	6.0	35	3 P	0 A	2:30 P	.04	
4	51.5	.525	73.5	S.S.W.	95	2.0	20	8 P				
5	48.0	.370	92 0	S.S.E.	150	1.0	14	3 A	4 A	8:30 P	.68	
6	49.0	.386	87.5	W.S.W.	156	1.5	17	2 P	8 P		T	
7	51.5	.482	78.5	W.	111	0.5	10	4 P				
8	54.5	.545	78.5	N.E.	71	2.0	20	9 P				
9	48.5	.507	69.5	N.N.W.	188	4.0	28	5 P	4 P	7 P	T	
10	46.0	.426	73.0	E.	137	1.0	14	8 A	10 P	11 P	T	
11	49.0	.430	82.0	N.N.W.	94	0.5	10	3 A				
12	50.0	.513	70.0	S.	100	0.5	10	8 P				
13	48.5	.500	69.5	S.S.E.	117	2.0	20	9 P				
14	49.0	.492	71.5	S.S.E.	109	0.0	—	—	2:30 P		T	
15	54.5	.587	74.0	N.	158	4.0	28	1 P				
16	56.0	.659	70.0	N.W.	84	3.5	26	6 P				
17	56.5	.720	64.5	S.S.W.	69	0.5	10	3 P				
18	59.0	.870	58.5	S.S.E.	219	2.5	22	6 P				
19	58.5	.660	78.0	S.S.E.	172	1.5	17	5 P	5 A	7 A	.25	
20	62.5	.717	80.0	S.S.E.	133	0.5	14	1 A	10:30 P	12 P	.15	
21	65.0	.780	78.5	E.	90	1.0	10	8 P				
22	63.0	.795	74.0	S.W.	56	1.0	14	6 P				
23	63.5	.846	69.5	S.	130	1.0	14	3 P				
24	61.0	.727	75.0	S.S.E.	203	1.0	14	2 P				
25	67.5	.820	83.0	S.S.W.	176	3.0	24	4 P	8:30 P	11 P	.09	
26	68.5	.823	85.5	W.	136	3.5	26	5 P	4 P	10 P	.06	
27	52.5	.555	71.5	W.N.W.	315	6.0	35	11 A				
28	59.5	.737	69.0	W.	102	0.5	10	2 P				
29	61.5	.632	85.0	S.	68	1.0	14	6 P	4 P	12 P	.25	
30	56 5	.561	81.5	N.W.	203	2.0	20	3 P	0 A	5:30 P	.51	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The unseasonable weather which characterized April and May was not prominent during June. Although the first part of the month was not as warm as usual, no especially low temperature was noted. The last part of the month was marked by a number of hot days.

A comparison of the records with those of previous years, shows the following features of more or less interest: The mean barometer was slightly lower than usual and the range about normal The maximum and minimum records were both slightly below the average.

The mean temperatu.e was about two degrees below the normal; the maximum was high and the minimum low, giving a larger range than usual.

The mean dew point was over two degrees below the normal while the relative humidity was nearly five per cent higher than usual.

The total precipitation was about sixty per cent of the usual amount, most of it falling near the beginning or the end of the month. A number of thunder storms occurred during the last decade of the month.

The total wind movement was about twenty per cent more than usual although but two light gales were noted.

The amount of sunshine was sightly less than usual.

J. E. OSTRANDER Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 223. JULY, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.89, 15th, 8 A.
Minimum reduced to freezing, 29.14, 26th, 2 P.
Reduced† maximum reading, 30.18, 15th, 8 P.
Reduced† minimum reading, 29.42, 26th, 2 P.
Mean semi-daily reduced, ... 29.869
Monthly range, ... 0.76

****Air Temperature.*** In Degrees Fahr.

Highest, ... 90.0, 18th, 3 P.
Lowest, ... 44.0, 4th, 5:30 A.
Mean hourly, ... 70.0
Mean of means of max. and min., ... 70.4
Mean sensible (wet bulb), ... 64.1
Monthly range, ... 46.0
Highest mean daily, ... 78.6, 18th
Lowest mean daily, ... 61.7, 11th
Mean maximum, ... 82.0
Mean minimum, ... 58.6
Mean daily range, ... 23.4
Greatest daily range, ... 36.0, 4th, 5th
Least daily range, ... 12.0, 11th

Humidity.

Mean dew point, ... 61.0
Mean force of vapor, ...721
Mean relative humidity, ... 76.4

Precipitation. In inches.

Total precipitation, ... 3.87
Number of days on which .01 inch or more rain or melted snow fell, ... 10

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4114 m.
Greatest daily movement, ... 316 m., 27th
Least daily movement, ... 43m., 14th
Mean daily movement, ... 133 m.
Mean hourly velocity, ... 5.5 m.
Maximum pressure per square foot, 32.5 lbs.= 81 m. per hour, 20th, 8 P., W.
Maximum velocity for 5 minutes, 36 m. per hour 20th, 8 P., W.
Prevailing Direction, West Southwest.

Summary.

South, ... 16 per cent.
West, ... 16 " "
Southwest, ... 13 " "
West Southwest, ... 13 " "
South Southwest, ... 10 " "
West Northwest . . . . . 10 " "
Other directions, ... 22 " "

Weather.

Mean cloudiness observed, ... 42 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 165 hrs.=56 per cent.
Number of clear days, ... 10
Number of fair days, ... 18
Number of cloudy days, ... 3

Bright Sunshine.

Number of hours recorded, . . 297 hrs.=64%

Rain, 2d, 6th, 7th, 9th, 11th, 12th, 17th, 20th, 22d, 24th, 26th.

Gales, 35 miles or more per hour, 37 m. 6th, S.; 35m. 9th, W.; 81m. 20th, W.; 35m. 27th, W.N.W.

Thunder and Lightning, 6th, 7th, 9th, 17th, 20th, 24th, 26th.

Hail, 7th, 20th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.81	29.72	29.792	86.5	4 P	61.5	3 A	74.0	74.0	67.3	11.7
2	29.84	29.72	29.770	78.5	3 P	64.5	4 A	71.5	69.8	61.3	6.5
3	30.04	29.84	29.973	74.5	4:30 P	52.0	12 P	63.3	66.2	62.5	13.3
4	30.11	29.99	30.063	80.0	5 P	44.0	5:30 A	62.0	64.7	58.3	13 5
5	30.01	29.87	29.949	84.5	4 P	48.5	5 A	66.5	67.9	60.3	9.0
6	29.91	29.79	29.863	86.0	4 P	54.0	6 A	70.0	68.8	64.3	10.0
7	29.85	29.80	29.834	80.0	1 P	62.5	4 A	71.3	69.4	65.0	6.5
8	29.98	29.75	29.871	85.5	3 P	66.0	5 A	75.7	75.1	69.0	9.8
9	29.78	29.67	29 738	83.0	1 P	65.5	5 A	74.3	74.2	65.3	13.0
10	29.91	29.78	29.854	81.0	5 P	54.5	5 A	67.7	69.9	62.5	12.0
11	29.94	29.84	29.903	67.0	1 P	55.0	5 A	61.0	61.7	59.7	0.0
12	29.84	29.69	29.749	73.5	3 P	59.0	3 A	66.3	64 1	59.3	6.3
13	30.02	29.83	29.974	81.5	5 P	58.5	5 A	70.0	69.7	63.7	13.0
14	30.13	30.02	30.073	85.5	6 P	53.0	5 A	69.3	69.9	60.0	12.5
15	30.18	30.07	30.100	80.5	4:30 P	61.5	4 A	71.0	70.2	63.7	10.0
16	30.13	30.02	30.060	81.0	2:30 P	59.5	4 A	70.3	70.1	65.5	6.8
17	30.05	29.94	29.995	88.0	2 P	69.5	3 A	78.7	74.4	70.7	4.6
18	30.01	29.96	29.983	90.0	3 P	68.0	4 A	79.0	78.6	72.3	10.7
19	30.00	29.93	29.956	87.0	2 P	61.5	5:30 A	74.3	74.4	67.3	11.6
20	29.93	29.71	29.816	83.5	4 P	60.0	12 P	71.7	69.7	66.7	5.2
21	29.90	29.75	29.869	80.0	4 P	58.5	5 A	69.3	68.3	59.5	13.3
22	29.90	29.76	29.835	83.0	0:30 P	54 0	4:30 A	68.5	68.9	67.0	9.5
23	29.87	29.71	29.781	82.0	12 M	61.5	12 P	71.7	71.3	65.5	6.3
24	29.94	29.82	29.894	79.0	4:30 P	56.5	5 A	67.7	67.0	64 5	8.0
25	29.82	29.72	29.760	89.0	4 P	63.5	0 A	76.3	74.7	69 0	11.0
26	29.75	29.42	29.590	84.0	2 P	60.0	4 A	72.0	69.5	61.7	6.6
27	29.73	29.59	29.660	77.0	4 P	56.0	5 A	66.5	67.3	58.5	12.3
28	29.82	29.73	29.813	82.5	4 P	58.5	4 A	70.5	70.6	62.5	12.0
29	29.84	29.74	29.821	85.0	2 P	57.0	5 A	71.0	69.8	62.7	11.2
30	29.82	29.71	29.782	82.5	1:30 P	60.5	12 P	71.5	70.9	64.7	10.0
31	29.83	29.79	29.819	82.5	6 P	54.5	5 A	68.5	70.0	65.5	12.6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	64.0	.793	77.0	W.S.W.	184	3.0	24	3 P				
2	64.0	.730	83.0	W.	111	0.5	10	5 P	8:30 A	4:30 P	.21	
3	59.5	.673	77.0	N.	174	2.0	20	1 P				
4	54.5	.588	74.0	N.	146	0.5	10	11 A				
5	58.0	.608	80 0	S.S.W.	78	0.5	10	4 P				
6	62.0	.674	83.0	S.	125	7.0	37	5 P	4:30 P	5:30 P	.09	
7	63.0	.680	86.0	S.S.E.	131	2.0	20	4 P	1 P	3 P	.41	
8	67.0	.811	82.0	S.W.	106	1.0	14	4 P				
9	61.0	.809	68.5	W.	242	6.0	35	4 P	11 A	11,30 A	.02	
10	57.0	.755	62.0	W.S.W.	131	1.5	17	5 P				
11	58.0	.559	87.0	S.E.	52	0.0	—	—	8:30 A	12 P	.78	
12	56.5	.575	82.0	W.	96	2.5	22	8 P	0 A	2 P	.46	
13	59.0	.752	68.5	W.N.W.	111	0.5	10	4 P				
14	55.5	.671	66.0	S.W.	43	1.0	14	2 P				
15	61.5	.681	82.0	S.	142	0.5	10	5 P				
16	63.5	.709	85.0	S.	159	1.5	17	5 P				
17	69.0	.805	88.5	S.W.	187	3.0	24	4 P	3:30 P	8 P	.65	
18	69.5	.970	75.0	W.S.W.	81	0.5	10	8 P				
19	64.0	.813	73.5	W.	112	0.5	10	5 P				
20	64.0	.757	81.5	S.	112	32.5	81	9 P	8 P	10 P	.70	
21	54.0	.681	61.0	W.N.W.	147	2.0	20	12 M				
22	64.0	.772	79.0	S.S.W.	83	1.5	17	11 A	2 P	8 P	T	
23	63.5	.734	79.0	N.W.	130	1.0	14	10 A				
24	62.0	.660	86.0	S.E.	98	1.5	17	7 P	7:30 P	10 P	.30	
25	66 0	.850	77.0	S.S.W.	138	0.5	10	2 A				
26	58.0	.654	75.5	S.S.W.	152	5.0	32	7 P	6 A	4 P	.25	
27	52.0	.677	58.5	W.N.W.	316	6.0	35	3 P				
28	57.0	.743	64.0	W.	154	1.0	14	3 P				
29	59.5	.686	74.5	S.	156	4.5	30	6 P				
30	62.0	.721	77.5	W.S.W.	102	1.5	17	3 P				
31	62.5	.757	75.5	N.W.	115	1.0	14	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during July was generally seasonable and the means of the several elements showed no marked departures from the normals, excepting the mean barometer. Thunder storms were quite frequent and the one on the evening of the 20th was accompanied by a heavy gale which did a considerable amount of damage, mostly in blowing and breaking down trees in this vicinity.

A comparison of the records with those of previous years shows the following features: The mean pressure was lower than any previous July since this station was established: Both the maximum and minimum were low while the range was normal.

The temperature records were normal excepting the maximum which was lower than usual. The relative humidity was about three per cent higher than usual.

The precipitation for the month was nearly 80 per cent of the normal and was well distributed throughout the month. Much of it occurred during thunder storms.

The total wind movement was about 20 per cent more than usual. The maximum pressure during the gale of the 20th was unusually high for this station.

The amount of sunshine recorded was large and but three cloudy days were noted.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 224. AUGUST, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.06, 19th, 8 A.
Minimum reduced to freezing,	29.35, 25th, 3 A.
Reduced† maximum reading,	30.35, 19th, 8 A.
Reduced† minimum reading,	29.64, 25th, 3 A.
Mean semi-daily reduced,	29.995
Monthly range,	0.71

****Air Temperature.*** In Degrees Fahr.

Highest,	96.0, 12th, 4 P.
Lowest,	41.0, 29th, 6 A.
Mean hourly,	66.1
Mean of means of max. and min.,	66.5
Mean sensible (wet bulb),	60.2
Monthly range,	55.0
Highest mean daily,	78.5, 12th
Lowest mean daily,	56.0, 30th
Mean maximum,	79.2
Mean minimum,	53.8
Mean daily range,	25.4
Greatest daily range,	40.5, 19th
Least daily range,	7.5, 24th

Humidity.

Mean dew point,	56.5
Mean force of vapor,	.633
Mean relative humidity,	74.9

Precipitation. In inches.

Total precipitation,	1.44
Number of days on which .01 inch or more rain or melted snow fell,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3928m.
Greatest daily movement,	214 m., 26th
Least daily movement,	47m., 30th
Mean daily movement,	126 m.
Mean hourly velocity,	5.3 m.

Maximum pressure per square foot, 4.5 lbs.= 30 m. per hour, 22d, 9 A., N.N.W.

Maximum velocity for 5 minutes, 24 m. per hour 26th, 3 P., W.N.W.

Prevailing Direction, West Southwest.

Summary.

West,	10 per cent.
Northwest,	16 " "
South Southeast,	29 " "
West Northwest	13 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	36 per cent.
Total cloudiness recorded by the Sun Thermometer,	212 hrs.=49 per cent.
Number of clear days,	13
Number of fair days,	12
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 217 hrs.=51%

Rain, 1st, 2d, 4th, 5th, 6th, 17th, 21st, 24th, 27th, 28th, 30th.

Gales, 35 miles or more per hour, none.

Thunder and Lightning, 1st, 2d.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.81	29.78	29.802	83.5	12 M	59.5	3:30 A	71.5	69.3	68.5	5.8
2	29.86	29.73	29.801	84.5	3:30 P	58.0	3 A	71.3	69.6	62.5	6.3
3	29.97	29.86	29.956	80.0	4 P	58.0	12 P	69.0	68.7	61.0	11.6
4	30.10	29.92	29.995	75.5	3 P	55.0	12 P	65.3	62.7	56 0	7.1
5	30.18	30.08	30.133	77.5	3 P	48.0	5:30 A	62.7	62.5	62.7	9.7
6	30.09	29.96	30.019	77.5	4 P	62.0	12 P	69.7	67.2	62.0	4.7
7	30.02	29.90	29.967	86.5	5 P	54.5	5 A	70.5	71.8	65.7	12.0
8	30.10	29.91	30.021	84.0	4 P	58.0	12 P	71.0	71.9	65.7	12.0
9	30.18	30.10	30.161	78.0	4 P	54.5	5 A	66.3	66.0	61.3	9.0
10	30.12	29.99	30.056	88.0	5 P	54.0	5 A	71.0	71.6	66.3	12.8
11	30.01	29.82	29.928	91.0	4 P	59 5	5:30 A	75.3	75.0	66.3	10.7
12	29.87	29.77	29.833	96.0	4 P	68.5	3 A	82.3	78.5	69.3	9.5
13	29.92	29.79	29.845	83.5	3 P	66.0	12 P	74.7	73.7	63.3	11.4
14	30.21	29.92	30.082	76.5	5 P	52.0	12 P	64.3	64.6	56 5	13.5
15	30.31	30.21	30.281	79.0	3 P	42.0	6 A	60.5	61.0	56.5	13.0
16	30.29	30.13	30.244	80.0	3 P	43.0	5:30 A	61.5	63.0	57.3	11.0
17	30.15	29.96	30.046	80.0	4 P	60.0	4 A	70.0	67.7	65.0	5.0
18	30.28	30.01	30.144	83.0	3 P	53.0	12 P	68.0	69.7	58.5	12.1
19	30.35	30.21	30.280	82.5	4 P	42.0	5 A	62.3	63.0	56.7	12.0
20	30.21	29.95	30.083	88.0	2 P	57.0	3 A	72.5	71.3	65.5	9.6
21	30.01	29.96	29.997	71.0	10 A	59.0	12 P	65 0	64.2	63.3	0.0
22	30.23	30.01	30.146	79.0	3 P	55.0	11 P	67.0	65.3	54.5	11.6
23	30.27	30.10	30.188	79.0	3 P	54.0	2 A	66.5	64.4	55.5	7.5
24	30.10	29.68	29.846	62.5	8 P	55.0	8 A	58.7	58.0	58.5	0.0
25	29.71	29.64	29.684	76.0	4 P	59.0	6 A	67.5	66.0	60.3	9.0
26	29.89	29.71	29.793	73.5	1:30 P	52.0	12 P	62.7	61.8	53.7	11.5
27	29.90	29.81	29.860	74.0	3 P	49.0	4:30 A	61.5	60.1	54.3	2.5
28	29.88	29.79	29.829	74.0	3 P	49.0	12 P	61.5	62.5	58.3	9.0
29	29.96	29.88	29.923	73.0	3 P	41.0	6 A	57.0	57.9	52.5	11.5
30	29.98	29.87	29.943	69 0	12 M	42.0	5 A	55.5	56.0	51.5	4.0
31	29.98	29.89	29.965	71.0	2 P	49.0	6 A	60 0	60.9	55.7	9.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	66 5	.781	84.0	S.S.W.	95	2.5	22	3 P	0:30 P	3 P	.21	
2	59.5	.669	77.5	S.S.E	120	2.5	22	3 P	2 P	5 P	.04	
3	57.0	.658	72.0	W.	98	1.0	14	2 P				
4	53.0	.522	77.5	N.W.	102	1.0	14	11 A	2 A	4 P	.28	
5	60.5	.654	81 0	S.S.E.	112	1.5	17	10 P	9:30 P	12 P	.02	
6	58.5	.651	77.5	S.	150	1.5	17	7 A	0 A	5 P	.20	
7	62.5	.762	75.0	S.S.E.	68	0.5	10	4 P				
8	63.5	.736	80.0	N.	161	4.0	28	12 M				
9	58.0	.637	77.5	E.	69	1.0	14	7 P				
10	63 5	.760	79.5	S.S.E.	98	0.0	—	—				
11	63.5	.768	78.5	S.S.E.	118	1.0	14	3 P				
12	66.5	.886	75.5	S.S.E.	112	1.0	14	8 P				
13	57.0	.822	58.0	W.	182	2.5	22	5 P				
14	50.5	.600	61.5	N.W.	205	2.5	22	1 P				
15	53.5	.553	73.5	W.N.W.	72	1.0	14	12 M				
16	54 0	.552	76.5	S.	173	3.5	26	6 P				
17	63.5	.666	91.5	S.S.E.	209	1.5	17	3 P	2 A	10 A	.15	
18	52.5	.660	60.5	W.N.W.	154	1.5	17	1 P				
19	52.5	.578	70.0	E.S.E.	64	0.5	10	7 P				
20	63.5	.715	83.5	S.S.E.	180	1.5	17	5 P				
21	62.5	.608	93.5	N.N.W.	124	1.0	14	11 A	8 A	3 P	.04	
22	49.0	.542	64.5	N.N.W.	148	4.5	30	9 A				
23	50.0	.563	66.0	S.S.E.	125	3.0	24	5 P				
24	58.0	.497	98.5	N.	52	0.0	—	—	1:30 A	9 P	.34	
25	55.0	.684	63.5	W.	134	2.0	20	4 P				
26	47.5	.542	60.5	W.N.W.	214	3.0	24	3 P				
27	50.0	.514	73.0	S.S.W.	123	2.0	20	4 P	6 P	12 P	.06	
28	55.0	.563	79.0	N.W.	97	1.5	17	4 P	0 A	2 A	.04	
29	48.5	.478	71.5	W.N.W.	132	2.0	20	2 P				
30	46 5	.459	70.0	N.W.	47	0.5	10	2 P	12: M	4 P	.06	
31	51.5	.534	73.0	N.W.	190	3.5	26	1 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The most noticeable features of the weather during August were the small precipitation, large number of pleasant days and the general absence of sultriness which so often characterizes this period. The last mentioned feature is best shown by the dew point and relative humidity records.

The barometric records were generally normal and presented no unusual characteristics. The change in pressure was small even on the days of greatest wind movement. The total wind movement was about one-third more than the normal and the large amount from the southeast quadrant was unusual for this station.

The mean temperatnre was nearly two degrees below the normal; the maximum was high and the minimum low giving a range considerably greater than usual. The record of 96 degrees reached on the 12th will probably prove to be the maximum for the year. The range of over 40 degrees on the 19th was rather unusual for this locality.

The total precipitation was only about three-tenths of the normal amount and was the smallest August record since the station was established, excepting that of 1894. The precipitation which did occur was in such small amounts that the soil was not wet to any depth, and toward the close of the month vegetation was suffering considerably on account of the drought. Notwithstanding the dry weather about the usual amount of cloudiness was noted.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 225. SEPTEMBER, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.09, 14th, 8 A.
Minimum reduced to freezing,	29.20, 24th, 3 P.
Reduced† maximum reading,	30.39, 14th, 8 A.
Reduced† minimum reading,	29.48, 24th, 3 P.
Mean semi-daily reduced,	30.015
Monthly range,	0.91

****Air Temperature.*** In Degrees Fahr.

Highest,	85.0, 16th, 1 P.; 21st, 1:30 P
Lowest,	36.0, 27th, 3 A.
Mean hourly,	61.3
Mean of means of max. and mn.,	62.0
Mean sensible (wet bulb),	57.1
Monthly range,	49.0
Highest mean daily,	71.7, 16th
Lowest mean daily,	46.5, 29th
Mean maximum,	70.7
Mean minimum,	53.4
Mean daily range,	17.3
Greatest daily range,	35.0, 13th
Least daily range,	3.0, 23d

Humidity.

Mean dew point,	54.6
Mean force of vapor,	.536
Mean relative humidity,	83.0

Precipitation. In inches.

Total precipitation,	8.74
Number of days on which .01 inch or more rain or melted snow fell,	13

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3582m.
Greatest daily movement,	253 m., 24th
Least daily movement,	32m., 10th
Mean daily movement,	119 m.
Mean hourly velocity,	5.0 m.

Maximum pressure per square foot, 6.0 lbs.= 35 m. per hour, 11th, 7 P., S.

Maximum velocity for 5 minutes, 30 m. per hour 28th, 3 P., S.S.W.

Prevailing Direction, South Southwest.

Summary.

South,	13 per cent.
Northwest.	10 " "
South Southeast,	23 " "
West Northwest	13 " "
Other directions,	41 " "

Weather.

Mean cloudiness observed,	64 per cent.
Total cloudiness recorded by the Sun Thermometer,	263 hrs.=71 per cent.
Number of clear days,	2
Number of fair days,	9
Number of cloudy days,	19

Bright Sunshine.

Number of hours recorded, 110 hrs.=29%

Rain, 2d, 3d, 4th, 5th, 9th, 10th, 11th, 17th, 17th, 18th, 21st, 23d, 24th, 27th, 28th, 29th.

Gales, 35 miles or more per hour, 35m. 11th, S.

Thunder and Lightning, 3d. 4th, 5th, 11th, 21st, 24th.

Frost, very light, 27th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.99	29 92	29.957	70.5	5 P	43.5	5 A	57.0	57.3	52.7	6.7
2	29.94	29.75	29.830	64.0	12 P	49.5	1 A	56.7	57.7	57.7	0.0
3	29.92	29.74	29.837	71.0	5 P	62.0	12 P	66.5	66.3	65.3	0.0
4	29.99	29.92	29.970	71.0	7 P	57.0	6 A	64 0	63.4	64.3	0 5
5	29.98	29.86	29.916	74.5	5 P	65.0	12 P	69.7	69.4	68.7	1.1
6	29.87	29.77	29.835	82.5	3 P	57.0	5:30 A	69.7	68.1	60.0	10.5
7	29.92	29.83	29.887	77.0	3 P	54.0	5 A	65.5	64 9	60.0	8.5
8	29.98	29.90	29.939	68.0	11 A	58.5	6 A	63.3	63 9	60.0	0.6
9	30.21	29.98	30 156	69.5	2 P	61.0	5 A	65.3	64.3	61.3	0 0
10	30.26	30.08	30.229	68.5	4 P	59.5	4 A	64.0	63.1	61.7	0 0
11	30.08	29.86	29.984	82.0	0:30 P	59 5	12 P	70.7	67.1	63.5	1.8
12	30.13	30.05	30.019	74.5	3:30 P	53.0	12 P	63 7	62.7	56.3	4.7
13	30.29	30.13	30.238	82.5	1 P	47.5	4:30 A	65.0	64.1	57.5	11.0
14	30.39	30 29	30.379	82.0	3 P	51.0	4:30 A	66.5	65.7	60 0	9.2
15	30.35	30.23	30.310	84.5	3 P	57.0	6 A	70.7	69.8	62.3	9.0
16	30 25	30.06	30.171	85.0	1 P	63.0	6 A	74.0	71.7	65.0	6.3
17	30.21	29.99	30.062	83.5	2 P	56.0	12 P	69.7	69 3	61 3	7.0
18	30.36	30.21	30.347	58.0	4 P	46.5	4:30 A	52.3	53.1	48.5	0.0
19	30.33	30.12	30.243	62.5	4:30 P	48.0	5 A	55.3	55.5	50.5	1.1
20	30.12	29.87	29.971	72.0	3 P	55.5	5 A	63.7	62.7	57.3	3.6
21	29 87	29.78	29.851	85.0	1:30 P	64.0	6 A	74 5	70.9	66.5	4.2
22	29.94	29.83	29.927	75.5	2 P	59 0	12 P	67.3	66.1	60.7	7.5
23	29.92	29.55	29.710	58.0	3 P	55.0	8 P	56.5	56.8	54.7	0.0
24	29.62	29.48	29 591	79.5	3 P	55.0	0 A	67.3	65.6	61 0	6.5
25	29.97	29.59	29.824	62.0	7 A	49.0	12 P	55.5	55 7	48 3	3.5
26	30.14	29.97	30.124	57.0	12 M	39 0	12 P	48.0	47.8	42.3	6.1
27	30.14	30 07	30.126	57.0	3 P	36.0	3 A	46.5	48.0	45.5	0 0
28	30.15	30.05	30.142	54.0	3 P	48.5	12 P	51.3	50 8	49.7	0.0
29	30.05	29.75	29.875	49 0	0 A	45.5	8 A	47.3	46.5	44.3	0.0
30	30.04	29.92	30.013	61.0	2 P	46 0	0 A	53 5	51.6	47.0	0.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	47.5	.418	66.0	N.W.	103	1.5	17	1 P				
2	56.5	.496	95.5	S.S.E	104	1.0	14	10 P	5 A	12 P	.24	
3	64.5	.639	96.0	S.E.	107	1.5	17	0 A	0 A	12 P	.76	
4	63.5	.630	94.5	S.	82	1.5	17	10 P	0 A	12 P	.54	
5	68.0	.740	93 0	S.S.E.	137	1.0	14	10 P	0 A	10 P	.49	
6	56.0	.630	71.5	W.S.W.	138	1.0	14	1 P				
7	56.5	.623	73.5	N.	75	0 0	—	—				
8	57.0	.585	82.0	N.N.E.	62	0.5	10	2 P				
9	59.5	.592	87.0	N.N.E.	64	0.0	—	—	8 P	12 P	T	
10	60 5	.571	94.5	S.E.	32	0.0	—	—	0 A	12 P	.19	
11	63.0	.616	92.5	S.	175	6.0	35	7 P	0 A	8 P	.72	
12	54.0	.505	83.5	W.	167	3.0	24	5 P				
13	51.0	.586	66.5	W.N.W.	57	1.0	14	6 P				
14	58.0	.620	80.5	S.S.E.	99	1.0	14	3 P				
15	58.5	.699	70.5	S.	165	0.5	10	3 P				
16	62 0	.722	79.0	S.S.E.	117	1.0	14	2 P				
17	58.0	.658	73.0	W.	217	2.0	20	6 P	0:30 P	12 P	.02	
18	45.5	.391	79.5	N.E.	88	0.0	—	—	0 A	7 A	.03	
19	46.5	.416	77.0	S.S.E.	39	0.0	—	—				
20	54.5	.538	80.0	S.S.E.	105	0.5	10	5 P				
21	66.5	.672	95.5	S.S.W.	112	0.5	10	12 M	3:30 P	8 P	.28	
22	58.0	.605	82.5	W.N.W.	84	0.0	—	—				
23	54.0	.440	95.5	N.W.	81	0.0	—	—	0 A	10:30 P	3.74	
24	59.5	.580	88.5	S.	253	2.5	22	4 P	4 P	5 P	.01	
25	43.0	.416	67.5	W.N.W.	250	3.5	26	10 A				
26	39.0	.310	77.0	W.N.W.	185	1.5	17	11 A				
27	43.5	.333	85.5	N.W.	108	0.0	—	—	2:30 P	4 P	T	
28	48.0	.372	91.5	E.	47	0.5	10	3 P	5 A	12 P	.40	
29	43 0	.308	92.0	N.N.W.	217	1.5	17	3 P	0 A	2:30 P	1.32	
30	44 0	.359	80.0	S.S.E.	112	2.0	20	6 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The drought, which was quite marked during the last part of August, was effectually broken early in September by a rainfall of about two inches. The precipitation later in the month was augmented by a number of heavy rains, which resulted in making the total for the month more than twice the normal. A new high record for September was made, and the only monthly records exceeding that of this month since the station was established are those of July, 1897, 14.51 in.; and August, 1904, 9.09 in.

The amount of sunshine was but little more than half the normal, giving a new low record for the month for that weather element.

The mean relative humidity, while nearly seven per cent more than normal, was less than several previous September records.

The mean barometer was nearly normal and the range a little larger than usual.

The total wind movement was larger than usual although but one gale was noted.

Notwithstanding the small amount of sunshine the mean temperature was practically normal. The maximum was rather low and the minimum high giving a range considerably smaller than the average.

The mean dew point was normal; a very slight frost was noted in a few places on the morning of the 27th.

J. E. OSTRANDER Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 226. OCTOBER, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.30, 31st, 11 A.
Minimum reduced to freezing,	29.07, 8th, 7 A.
Reduced† maximum reading,	30.60, 31st, 11 A.
Reduced† minimum reading,	29.36, 8th, 7 A.
Mean semi-daily reduced,	30.051
Monthly range,	1.24

****Air Temperature.*** In Degrees Fahr.

Highest,	73.0, 4th, 3 P.
Lowest,	20.5, 27th, 6 A.
Mean hourly,	45.6
Mean of means of max. and min.,	45.7
Mean sensible (wet bulb),	41.0
Monthly range,	52.5
Highest mean daily,	59.1, 7th
Lowest mean daily,	34.6, 21st
Mean maximum,	58.6
Mean minimum,	33.5
Mean daily range,	25.1
Greatest daily range,	38.5, 16th
Least daily range,	5.0, 28th

Humidity.

Mean dew point,	37.1
Mean force of vapor,	.302
Mean relative humidity,	77.7

Precipitation. In inches.

Total precipitation,	5.00
Number of days on which .01 inch or more rain or melted snow fell,	7

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5111 m.
Greatest daily movement,	460 m., 8th
Least daily movement,	51 m., 2d
Mean daily movement,	165 m.
Mean hourly velocity,	6.9 m.

Maximum pressure per square foot, 9.0 lbs.= 42 m. per hour, 8th, 6 A., S.

Maximum velocity for 5 minutes, 36 m. per hour 8th, 6 A., S.

Prevailing Direction, West Southwest.

Summary.

South,	13 per cent.
Northwest,	16 " "
South Southeast,	23 " "
West	19 " "
Other directions,	29 " "

Weather.

Mean cloudiness observed,	30 per cent.
Total cloudiness recorded by the Sun Thermometer,	164 hrs.=48 per cent.
Number of clear days,	8
Number of fair days,	11
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 177 hrs.=52%

Rain, 4th, 7th, 8th, 11th, 20th, 27th, 28th, 29th.

Gales, 42 miles, 8th. S.

Thunder and Lightning, 8th.

Frost, 2d, 6th, 9th, 10th, 13th, 14th, 15th, 16th, 17th, 19th, 21st, 22d, 25th, 26th, 27th, 31st.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.17	29.98	30.116	58.5	3 P	37.0	12 P	47.7	48.3	43.7	7.3
2	30.24	30.07	30.178	66.0	4 P	31.0	6 A	48.5	46.8	42.7	9.3
3	30.13	29.88	30.027	70.0	3 P	36.0	5 A	53.0	52.0	48.0	4.4
4	29.88	29.46	29.580	73.0	3 P	49.0	12 P	61.0	61.3	59.3	1.1
5	29.76	29.58	29.640	63.0	3 P	45.0	6 A	54.0	53.2	50.5	5.8
6	29.99	29.76	29.968	61.0	3 P	35.0	6 A	48.0	48.5	44.3	8.0
7	29.98	29.68	29.871	69.5	1:30 P	47.0	0 A	58.3	59.1	54.5	5.1
8	30.10	29.36	29.698	66.0	8 A	38.0	12 P	52.0	53 4	52.0	0.0
9	30.27	30.10	30 217	59.0	3 P	28.0	6 A	43.5	41.7	36.5	9.3
10	30.13	29.94	30.086	58.0	3 P	31.0	6 A	44.5	45.5	41.7	4.0
11	29.96	29.81	29.882	64.0	4 P	44.0	4 A	54.0	51.7	48.5	1.0
12	30.00	29.85	29.956	62.5	3 P	38.0	12 P	50.3	49.5	45.7	9.0
13	30.03	29.94	30.020	61.5	2 P	30.0	6 A	45.7	45 0	40.0	8.9
14	30.22	30.03	30.164	62.0	3 P	34.0	6 A	48.0	46.1	41.5	9.0
15	30.32	30.19	30.288	55.0	2 P	28.0	6:30 A	41.5	40.9	34.5	3.8
16	30 44	30.32	30.408	65.0	3 P	26.5	6 A	45.7	44.5	36.5	8.6
17	30.36	30.03	30.209	68.0	3 P	34.0	7 A	51.0	50.7	43.5	6.0
18	30.10	29.75	29.994	64.5	1 P	33.0	12 P	48.7	50.1	43.5	6.0
19	30.24	30.10	30.236	50.0	2:30 P	25.5	6:30 A	37.7	35.8	30.7	7.3
20	30.20	30.01	30.092	42.0	1 P	33.0	0 A	37.5	37.1	35.7	0.0
21	30.27	31.02	30.248	43.0	4 P	28.5	12 P	35.7	34.6	27.0	9.7
22	30.26	29.87	30.063	58.0	2 P	25 5	6 A	41.7	41.5	37.0	8.5
23	29.94	29.72	29.863	53 0	4:30 P	36.0	12 P	44.5	43.5	40.0	0.3
24	30.10	29.94	30.098	51.0	3 P	28.0	12 P	39.5	39.4	33.0	9.5
25	30.07	29.83	29.977	51.5	3 P	25.5	3 A	37.5	40.0	36.7	2.7
26	30.37	30.03	30.313	47.5	3 P	24.0	12 P	35.7	36.9	30.7	9.1
27	30.37	29.85	30.143	55.0	12 P	20.5	6 A	37.7	38.9	38.0	2.0
28	29.85	29.59	29.688	60.0	12 M	55.0	0 A	57.5	57.2	55.7	0.0
29	29.89	29.51	29.734	56.0	0 A	39.0	12 P	47.5	45.1	40.5	1.1
30	30.47	29.89	30.247	46.5	2 P	29 5	12 P	38.0	37.8	31.0	8.5
31	30.60	30.47	30.587	56.5	4 P	25.0	6:30 A	40.7	36.8	28.3	10.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	40.5	·323	77·5	N.W.	243	3.5	26	10 A				
2	41.0	·292	88.5	W.S.W.	51	0.0	—	—				
3	47·5	·375	91.0	S.S.E	52	0.0	—	—				
4	58.5	·538	90.5	S.S.E.	235	3.0	24	10 A	3:30A	10 A	·57	
5	47.0	·420	77 0	W.	144	3.0	24	12 M				
6	41.0	·329	77·5	W.	132	2.0	20	1 P				
7	52.0	·478	82·5	S.	311	4.0	28	3 P	1:30A	2:30 A	.01	
8	50.0	·451	88.0	W.S.W.	460	9.0	42	6 A	2 A	12 M	1.19	
9	32·5	·250	77·5	S.W.	71	0.5	10	8 P				
10	38.5	.296	81.0	S.	154	1.5	17	2 P				
11	46.0	·371	85.0	S.S.E.	184	3.0	24	4 P	7:30A		T	
12	42.5	·345	80.0	W.	102	0.5	10	3 P				
13	36.0	·276	79.0	N.N.W.	108	2.0	20	9 A				
14	38.0	.296	78.0	N.W.	102	1.5	17	9 A				
15	31·5	.223	80.0	W.N.W.	78	1.0	14	2 P				
16	32.5	·250	74.0	S.S.E.	60	0.5	10	3 P				
17	40.0	·337	79.0	S.E.	82	0.0	—	—				
18	36.0	·341	65·5	S.S.E.	103	4.0	28	3 P				
19	25.0	.178	72.0	W.	204	3.0	24	4 A				
20	33.0	.222	84·5	S.	65	0.0	—	—	5 A	9 P	.36	
21	18.0	.179	57·5	N.W.	207	3.0	24	2 P				
22	32.0	.254	74.0	S.	234	3.0	24	3 P				
23	37.0	.271	81.0	N.E.	187	3.5	26	6 P				
24	26 5	.220	65.0	N.N.W,	349	4.0	28	8A				
25	30 5	.260	67.0	W.	137	2.5	22	6 P				
26	24.0	.198	68.0	N.W.	165	1.0	14	12 M				
27	35.0	.272	83.0	S.S.E.	68	1.5	17	11 P	4 P	12 P	.30	
28	55.0	.458	92.5	S.E.	133	2.0	20	3 A	0 A	12 P	1.54	
29	37.0	.278	80.5	W.	252	3.0	24	8 P	0 A	2 P	1.03	
30	22 5	.203	61.0	W.N.W.	341	5.0	32	3 P				
31	24.0	.178	72 5	N.W.	97	1.0	14	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during October was generally seasonable although the records for some of the weather elements showed a considerable departure from the normals. Frosts were frequent, and on a few dates ice was formed in shallow places. The ground was frozen a few mornings near the close of the month.

The rainstorm of the 27th—29th was very heavy in this section, the amount being very nearly three inches.

The mean barometer was slightly lower than usual, and nearly the whole range for the month occurred in 56 hours. The maximum and minimum records were both higher than the October average for those records.

The mean temperature was one and one-half degrees below the normal, and the maximum and minimum were both low. The temperature fell below the freezing point on 14 dates.

The mean dew point was over 4 degrees below the normal, and the relative humidity was 3 1-2 per cent. higher than usual.

The total precipitation was about one-third more than the normal, —more than one-half the total occurring during a single storm. The number of days showing precipitation was very small considering the total for the month.

The total wind movement was about one-fourth more than usual, although but one gale was noted. The amount of sunshine was slightly more than the average.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No 227. NOVEMBER, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.28, 1st, 8 A.
Minimum reduced to freezing,	28.70, 6th, 11 P.
Reduced† maximum reading,	30.59, 1st, 8 A.
Reduced† minimum reading,	29.00, 6th, 11 P.
Mean semi-daily reduced,	30.049
Monthly range,	1.59

****Air Temperature.*** In Degrees Fahr.

Highest,	60.0, 2d, 12 P.; 3d, 0 A.
Lowest,	19.5, 15th, 7 A.
Mean hourly,	37.6
Mean of means of max. and min.,	38.6
Mean sensible (wet bulb),	34.7
Monthly range,	40.5
Highest mean daily,	52.5, 3d
Lowest mean daily,	27.0, 30th
Mean maximum,	46.9
Mean minimum,	30.2
Mean daily range,	16.7
Greatest daily range,	32.5, 1st
Least daily range,	5.0, 25th

Humidity.

Mean dew point,	32.0
Mean force of vapor,	.221
Mean relative humidity,	85.9

Precipitation. In inches.

Total precipitation,	4.50
Number of days on which .01 inch or more rain or melted snow fell,	13
Total snow, in inches,	1

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	4773m.
Greatest daily movement,	376 m., 7th
Least daily movement,	32m., 21st
Mean daily movement,	159 m.
Mean hourly velocity,	6.6 m.
Maximum pressure per square foot, 8.5 lbs.= 41 m. per hour, 3d, 1 A., S. E.	
Maximum velocity for 5 minutes, 36 m. per hour 7th, 5 P., W.	
Prevailing Direction, West.	

Summary.

West,	17 per cent.
Southwest,	17 " "
North,	13 " "
South Southeast,	13 " "
West Northwest	10 " "
West Southwest	10 " "
Other directions,	20 " "

Weather.

Mean cloudiness observed,	48 per cent.
Total cloudiness recorded by the Sun Thermometer,	168 hrs.=57 per cent.
Number of clear days,	6
Number of fair days,	12
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 125 hrs.=43%

Rain, 2d, 3d, 6th, 7th, 10th, 18th, 19th, 21st 22d, 24th, 28th.

Snow, 24th, 25th, 26th, 27th.

Sleet, 21st.

Gales, 35 miles or more per hour, 41 m., 3d, S. E.; 36 m., 4th, N. W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.59	30.30	30.471	56.0	3 P	23.5	7 A	39.7	38.3	33.5	8.7
2	30.30	29 37	29.900	60.0	12 P	34.5	2 A	47.3	45.6	46.0	0.0
3	29.55	29.36	29.460	60.0	0 A	45.0	12 P	52.5	52.5	46.0	4.5
4	29.96	29 55	29.855	45.5	1 P	39.5	7 A	42.5	39.3	35 0	6.7
5	30.02	29.90	29.998	52.0	4 P	23.0	5 A	37.5	38.1	37.0	2.5
6	29.97	29 00	29.546	54.5	7 P	45.0	6 A	49.7	49.3	49.3	0.0
7	29.62	29.02	29.318	51.0	3 A	41.0	6 P	46.0	45.1	41.7	0.1
8	29.90	29.62	29.833	53.0	2 P	38.0	12 P	45.5	44.3	39.5	5.8
9	29.98	29.84	29.934	56.0	3 P	31.0	7 A	43.5	42.9	38.5	8.0
10	29.98	29.76	29.833	52.5	4 P	38.0	12 P	45.3	44.1	42 0	0.0
11	30.15	29.98	30.104	47.0	3 P	29.0	12 P	38 0	36.1	32.3	0.3
12	30.32	30.15	30 294	42.0	2 P	23.0	12 P	32.5	30.8	27.0	7.6
13	30.21	29 85	30.008	44.0	3 P	21.0	3 A	32.5	31.8	29.3	6.5
14	30.28	29.82	30.109	36.5	1 P	25.0	12 P	30.7	31.5	29.0	8.0
15	30 41	30 26	30.368	41.5	3 P	19.5	7 A	30.5	30.2	27.3	7.0
16	30.38	30.19	30.300	44.0	3 P	23.5	7 A	33.7	31 0	27.3	6.3
17	30.37	30.18	30.320	48.5	3 P	21 5	7 A	35.0	32.2	27.5	5.7
18	30.38	30.23	30.301	41.0	3 P	25.0	4 A	33 0	33.2	32.3	0.0
19	30 31	30.08	30.211	50.5	2 P	34.5	5 A	42.5	40.3	35.7	5.5
20	30.50	30 31	29.493	45.0	3 P	29.0	12 P	37.3	34.5	30.3	7.9
21	30 45	30.17	30.282	39.0	3 P	29.0	0 A	34.0	34.7	34.7	0.0
22	30.18	30.12	30.175	51.0	3 P	37.0	12 P	44.0	42.7	41.3	0 2
23	30.35	30.28	30.291	50.5	2 P	32.0	5 A	41.3	40.5	36 5	7.5
24	30 37	30 08	30.279	41.0	12 M	33.0	6 A	37.0	35.2	33 3	0.2
25	30.08	29.77	29.864	39.0	12 M	34.0	10 P	36.5	36.1	34.7	0.3
26	29.82	29 65	29.748	38.0	12 M	28.0	7 A	33.0	33.2	30.3	4.0
27	29.94	29 71	29.914	42.0	1 P	29.0	3 A	35.5	33.8	31.7	5.0
28	29.89	29 74	29.807	47.0	2 P	30.0	1 A	38.5	38.4	36.7	0 6
29	30.24	29 89	30.171	41.0	2 P	24.0	12 P	32.5	34.3	31.0	8.0
30	30.28	30.18	30.244	38.5	3 P	21.0	7 A	29.7	27.	24.0	8.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	29 5	.216	78.5	S.W.	34	0.0	—	—				
2	44.0	.343	87.5	S.S.E.	70	4.0	28	11 P	9 A	12 P	.45	
3	42.5	.353	76.5	S.W.	321	8.5	41	1 A	0 A	4 A	.18	
4	30.5	.229	74.5	W.N.W.	260	6.5	36	4 P				
5	34.5	.243	88.5	S.S.E.	60	1.5	17	8 P				
6	48.5	.359	95.0	E.N.E.	204	2.5	22	11 P	7 A	12 P	1.78	
7	39.0	.286	84.5	W.	376	5.5	33	5 P	0 A	11 A	.41	
8	36.0	.268	81.0	S.W.	350	5.0	32	1 A				
9	36.0	.256	85.0	S.S.E.	133	2.0	20	5 P				
10	40.5	.281	90.5	S.W.	103	1.5	17	7 P	4:30 A	2 P	.29	
11	29.5	.195	83.0	W.N.W.	90	1.5	17	4 P				
12	23.5	.156	83.5	W.S.W.	115	1.0	14	12 M				
13	25.0	.180	78.0	S.W.	122	2.5	22	3 P				
14	24.5	.175	79.5	W.	358	4.5	30	2 P				
15	25.0	.157	88.0	W.S.W.	134	0.5	10	2 P				
16	25.0	.152	88.5	S.S.E.	38	0.0	—	—				
17	25.5	.157	89.5	W.N.W.	53	0.0	—	—				
18	31.0	.195	95.0	S.	57	0.5	10	6 P	4:30 P	12 P	.05	
19	32 5	.227	81.0	N.	177	3.0	24	3 P	0 A	5 A	.12	
20	26 5	.170	83.0	W.	152	1.0	14	2 P				
21	33 5	.206	95.0	N.	32	0.5	10	12 M	5 A	12 P	.16	
22	40 5	.269	94.0	N.N.W.	43	0.0	—	—	0 A	6 A	.06	
23	33.0	.243	81.0	N.	81	1.0	14	6 P				
24	31.5	.195	93.0	N.	278	3.5	26	1 P	11 A	12 P	.30	½
25	32.0	.210	88.5	N.N.W.	370	4.0	28	9 A	0 A	5 P	.52	½
26	27.5	.175	89.5	N.W.	100	0.5	10	12 M	12 M	12 P	.12	T
27	30.0	.188	90.0	W.	171	5.5	33	3 P	0 A	5 A	.06	T
28	33 5	.233	85.5	W.S.W.	147	3.0	24	12 P	7 A	11 A	T	
29	28.5	.182	85.5	W.	246	4.5	30	1 A				
30	21.0	.138	84.5	N.W.	94	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during November, while generally normal, showed a few departures of considerable magnitude from the usual records for this month. The mean relative humidity record was unusually high as noted below.

The precipitation record and minimum temperature were also somewhat abnormal.

A comparison of records with those of former years, and an examination of the charts, show the following features of interest: The mean barometer was practically normal, the minimum was unusually low, giving a range considerably larger than usual. During the first week of the month the fluctuations were large and rapid; on two dates, the fall was nearly one inch during the calendar day. The remainder of the month had a number of rapid changes but of considerably less magnitude.

The mean temperature was practically normal. The maximum was more than four degrees lower and the minimum over eight degrees higher than the usual records, giving a very small range for the month.

The mean dew point was slightly higher than the normal and the relative humidity over eleven per cent above the mean, giving a new high record for that element for November.

The total precipitation was about one-third more than usual and was well distributed throughout the month. There was a wet snowfall near the end of the month, which soon melted.

The total wind movement was about ten per cent more than the normal. On eight dates, the record exceeded 240 miles, or an average of ten miles per hour. The pressure chart showed but two gales.

The amount of sunshine was practically normal.

J. E. OSTRANDER. Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 228. DECEMBER, 1907.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.13, 21st, 10 P.
Minimum reduced to freezing,	28.74, 23d, 10 P.
Reduced† maximum reading,	30.45, 21st, 10 P.
Reduced† minimum reading,	29.05, 23d, 10 P.
Mean semi-daily reduced,	30.025
Monthly range,	1.40

****Air Temperature.*** In Degrees Fahr.

Highest,	60.5, 10th, 9 A.
Lowest,	10.0, 20th, 7 A.
Mean hourly,	30.5
Mean of means of max. and min.,	31.2
Mean sensible (wet bulb),	27.5
Monthly range,	50.5
Highest mean daily,	53.2, 10th
Lowest mean daily,	21.0, 5th
Mean maximum,	39.0
Mean minimum,	23.3
Mean daily range,	15.7
Greatest daily range,	31.5, 9th
Least daily range,	6.0, 4th

Humidity.

Mean dew point,	23.7
Mean force of vapor,	.177
Mean relative humidity,	80.4

Precipitation. In inches.

Total precipitation,	3.89
Number of days on which .01 inch or more rain or melted snow fell,	9
Total snow, in inches,	7.5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5266m.
Greatest daily movement,	419 m., 10th
Least daily movement,	18m., 8th
Mean daily movement,	173 m.
Mean hourly velocity,	7.2 m.

Maximum pressure per square foot, 18.5 lbs.= 61 m. per hour, 10th, 12M., S. S. E.

Maximum velocity for 5 minutes, 42 m. per hour 10th, 10A., S. S. E.

Prevailing Direction, West.

Summary.

West,	19 per cent.
Southwest,	10 " "
South,	16 " "
Northwest	10 " "
North Northwest	10 " "
West Southwest	13 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed,	51 per cent.
Total cloudiness recorded by the Sun Thermometer,	161 hrs.=57 per cent.
Number of clear days,	6
Number of fair days,	13
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded,	122 hrs.=43%

Rain, 10th, 16th, 23d, 25th, 28th, 30th.

Snow, 2d, 4th, 14th, 15th, 16th, 25th, 31st.

Sleet, 14th.

Days Sleighing, 9

Gales, 35 miles or more per hour, 36 m., 5th. N.; 61m., 10th, S.S.E., 37m., 12th, W.; 40 m., 14th, N.N.E.; 42 m. 24th, W.; 50m. 31st, N. W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.23	29.92	30.097	29.0	3 P	21.5	1 A	25.3	25.4	23.5	0.5
2	30.04	29.82	29.945	31.5	3 P	20.0	3 A	25.7	25.5	23.0	1.7
3	30.26	30.04	30.216	34.0	2 P	17.5	7 A	25.7	25.7	22.3	6.9
4	30.24	30.14	30.220	26.0	3 P	20.0	12 P	23 0	22.4	20.5	0.3
5	30.15	29.95	30.046	33.0	3 P	16.0	7 A	24.5	21.0	16.5	7.8
6	30.17	30.02	30.123	37.0	3 P	15.0	5 A	26.0	27.1	25.5	0.0
7	30.18	30.10	30.168	50.0	2:30 P	25.5	6 A	37.7	33.3	26.7	7.2
8	30.23	30.16	30.193	44.0	4 P	21.0	4 A	32.5	29.4	25.7	4.0
9	30.20	29.92	30.100	52.5	2:30 P	21.0	7:30 A	36.7	37.0	32.3	5.7
10	29.92	29.33	29.473	60.5	9 A	45.5	4 A	53.0	53.2	54.3	0.0
11	29.67	29.34	29.594	50.0	0 A	29.0	12 P	39 5	36.9	32.0	4.0
12	30.06	29.67	29 892	32.0	1:30 P	22.0	12 P	27.0	27.4	24.7	5.2
13	30.28	30.06	30.212	36 5	3 P	20.5	7 A	28.5	26.7	24.0	8.3
14	30.28	29.81	30.061	30.0	6 P	23.0	1 P	26.5	25.8	25.0	0.0
15	29 81	29 63	29.690	35.0	2 P	22.5	1 A	28.7	28.8	27.7	1.0
16	29 87	29.61	29.741	36.5	2 P	25.0	2 A	30 7	29.1	26 7	1.8
17	30.10	29 87	30.017	35.0	2 P	25.0	0 A	30.0	30.7	28.7	6.5
18	30.12	30.01	30.061	35.0	2 P	23.0	7:30 A	29 0	28 4	25.0	0.0
19	30 27	30.03	30.201	32.0	3 P	13 5	7 A	22.7	23 4	18 0	7.3
20	30.30	30 17	30.220	29.5	4 P	10 0	7 A	19 7	21.7	19.0	5.0
21	30.45	30.18	30.307	41.5	2 P	23.0	12 P	32.3	30.3	25.7	6.5
22	30.42	30.11	30.253	39.5	3 P	16.0	8 A	27.7	27.9	22.0	8.0
23	30.11	29.05	29.917	42.0	9 P	32.0	6 A	37.0	35 1	33.0	0.0
24	29 82	29 06	29.988	42 0	7:30 A	29.0	12 P	35 5	37.0	32.5	5.5
25	30.06	29.82	30.016	38.0	9 P	22.5	4 A	30.3	31.5	30.3	4 6
26	30.37	30.01	30.287	42.0	7 A	23 0	12 P	32.5	34.0	30.0	5.2
27	30.36	29.98	30.154	43.0	9 P	18.0	6 A	30.5	29.4	28 5	4.0
28	29.98	29 72	29.851	46.5	1 P	37.0	12 P	41.7	40.5	39.0	2.0
29	30.27	29.95	30.249	44.0	3 P	28.0	10 P	36.0	33.6	28.5	5.6
30	30.18	29.30	29.567	43 0	11 P	30 0	4 A	36.5	34.2	33.3	0.0
31	30.02	29 31	29 903	40.0	3 A	28.0	6 P	34.0	32.4	27.5	7.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	19 0	.134	81.5	N.E.	109	0.5	10	2 P				
2	19.0	.134	79.0	W.S.W.	81	1.5	17	6 P	7 A	2 P		T
3	18.5	.129	80.5	S.W.	113	0.0	—	—				
4	17.5	.117	83.0	N.N.W.	251	4.0	28	7 A	7 A	3 P	.03	½
5	13.0	.102	83.0	N.N.W.	347	6.5	36	9 A				
6	22.0	.155	81.0	W.S.W.	70	1.5	17	11 P				
7	23.0	.157	80.5	W.S.W.	128	0.5	10	4 P				
8	19.0	.153	71.5	N.N.W	18	0.0	—	—				
9	28.5	.217	81.0	S.	90	2.0	20	6 P	8 P	12 P	T	
10	53.5	.440	92.5	S.	419	18.5	61	12 M	0 A	10 P	1.18	
11	26.5	.200	76.0	W.	240	3.0	24	4 P				
12	19.5	.148	74.5	W.	313	7.0	37	2 P				
13	20.5	.139	81 5	W.N.W.	213	3.5	26	8 A				
14	22.0	.142	85.0	N.N.E.	149	8.0	40	6 P	10 A	12 P	.82	6
15	25.0	.160	86.5	N.	192	2.0	20	3 A	0 A	12 P	.12	1
16	23.0	.157	80.5	N.W.	56	1.5	17	3 P	0 A	2 P	.04	T
17	25.0	.170	81.5	S.S.W.	190	2.5	22	3 P				
18	21.5	.144	82.5	S.W.	126	1.0	14	3 A				
19	12 5	.110	75.5	W.	93	2.5	22	3 P				
20	16 0	.115	85.0	S.	144	1.0	14	4 P				
21	20.5	.155	75.0	W.	164	5.5	33	10 A				
22	17 5	.187	76.0	S.	157	2.5	22	11 P				
23	30.5	.196	90.0	W.	113	2.0	20	10 P	8 A	11 P	1.04	
24	25.5	.233	66.5	W.S.W.	361	9.0	42	9 A				
25	26 0	.236	78.0	S.	106	1.5	17	12 P	2 P	6 P	.01	T
26	32.5	.286	79.0	W.N.W.	216	2.5	22	12 M				
27	25.5	.180	84.5	S.W.	38	1.5	17	12 P				
28	36.0	.258	84.5	W.	199	2.0	20	11 A	12 M	3 P	.04	
29	23.5	.172	74.0	N.W.	144	2.0	20	7 A				
30	32.0	.197	93.0	S.S.E.	63	3.0	24	11 P	6:30 A	7 P	.61	
31	21.5	.170	69.5	N.W.	363	12.5	50	11 A	8:30 A			T

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1907.

Pressure. In inches.

Maximum reduced to freezing, ... 30.44, Feb. 24th, 1 A.
Minimum reduced to freezing. . . . . 28.68, Apr. 9th, 12 P.
Maximum reduced to freezing and sea-level, ... 30.78, Feb. 24th, 1 A.
Minimum reduced to freezing and sea-level, ... 28.99, Apr. 9th, 12 P.
Mean reduced to freezing and sea-level, ... 30.018
Annual range, ... 1.79

****Air Temperature.*** In degrees Fahr.

Highest, ... 96.0, Aug. 12th, 4:00 P.
Lowest, ... —23.5, Jan. 24th, 7 A.
Mean, ... 45.2
Mean of means of max. and min., ... 45.4
Mean sensible (wet bulb), ... 40.8
Annual range, ... 119.5
Highest mean daily, ... 78.6, July 18th.
Lowest mean daily, ... —8.0, Jan. 24th.
Mean maximum, ... 55.8
Mean minimum, ... 35.1
Mean daily range, ... 20.7
Greatest daily range, ... 43.0, May 14th
Least daily range, ... 2.0, June 2d.

Humidity.

Mean dew point, ... 36.9
Mean force of vapor, ...355
Mean relative humidity, ... 77.9

Wind.

Prevailing direction, ... West

Summary.

North, Northwest, ... 10 per cent.
West, ... 10 " "
South, Southeast, ... 10 " "
Northwest, ... 11 " "
South, ... 9 " "
West, Northwest, ... 9 " "
Other directions, ... 41 " "
Total movement, ... 60.016 m.
Greatest daily movement, . . . 529 m., Feb. 3rd.
Least daily movement, ... 18 m., Dec. 8th.
Mean daily movement, ... 164 m.
Mean hourly velocity, ... 6.8 m.

Maximum pressure per square foot, 32.5 lbs.=81 m. per hour, July 20th, 8 P., W.
Maximum velocity for 5 minutes, 44 m. per hour, Mar. 20th, 3 A. W.N.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 42.27
Number of days on which .01 or more rain or melted snow fell, ... 122
Snow total in inches, ... 54.5

Weather.

Mean cloudiness observed, ... 49 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2137 hrs.=48 per cent.
Number of clear days, ... 95
Number of fair days, ... 155
Number of cloudy days, ... 115

Bright Sunshine.

Number of hours recorded, 2317 hrs.=52 per cent.

Dates of Frosts.

Last, ... May 22d
First, ... Sept. 27th

Dates of Snow.

Last, ... May 11th
First, ... Nov. 24th
Total days of sleighing, ... 67

Gales of 50 or More Miles Per Hour

Jan. 9th., 53 m.; W. N. W.
Feb. 3d, 63 m.; N. N. W.
Mar. 29th. 74 m.; W. N. W.
July 20th, 81 m.; W.
Dec. 10th. 61 m.; S. S. E.; 31st, 50 m.; N. W.

*Temperature in ground shelter.

T. A. BARRY,
Observer.

J. E. OSTRANDER,
Meteorologist.

BULLETIN No. 229. JANUARY, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.26, 19th, 12 P.
Minimum reduced to freezing,	28.56, 8th, 1 A.
Reduced† maximum reading,	30.59, 19th, 12 P.
Reduced† minimum reading,	28.86, 8th, 1 A.
Mean semi-daily reduced,	29.970
Monthly range,	1.73

****Air Temperature.*** In Degrees Fahr.

Highest,	53.0, 21st, 2 P.
Lowest,	−5.5, 31st, 7 A.
Mean hourly,	25.7
Mean of means of max. and min.,	25.8
Mean sensible (wet bulb),	22.1
Monthly range,	58.5
Highest mean daily,	40.2, 21st
Lowest mean daily,	2.0, 30th
Mean maximum,	35.3
Mean minimum,	16.3
Mean daily range,	19.0
Greatest daily range,	32.5, 20th
Least daily range,	7.5, 18th

Humidity.

Mean dew point,	16.5
Mean force of vapor,	.144
Mean relative humidity,	73.8

Precipitation. In inches.

Total precipitation,	2.25
Number of days on which .01 inch or more rain or melted snow fell,	10
Total snow, in inches,	1½

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	7770m.
Greatest daily movement,	473 m., 27th
Least daily movement,	40m., 11th
Mean daily movement,	251 m.
Mean hourly velocity,	10.5 m

Maximum pressure per square foot, 16.0 lbs.= 56 m. per hour, 27th, 9A., S. W.

Maximum velocity for 5 minutes, 42 m. per hour 22d, 2P., W. N. W.

Prevailing Direction, West.

Summary.

West,	16 per cent.
Southwest,	13 " "
Northwest	23 " "
West Northwest	13 " "
South Southwest	13 " "
Other directions,	22 " "

Weather.

Mean cloudiness observed,	37 per cent.
Total cloudiness recorded by the Sun Thermometer,	140 hrs.=48 per cent.
Number of clear days,	12
Number of fair days,	7
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 154 hrs.=52%

Rain, 4th, 7th, 8th, 12th, 16th, 22d, 26th, 27th

Snow, 4th, 7th, 9th, 15th, 23d, 24th, 27th, 28th, 29th

Sleet, 7th.

Days Sleighing, None

Gales, 36 m., 4th, W.; 50 m., 5th, W. N. W.; 36 m., 7th, S. S. W.; 35 m., 8th, W.; 40 m., 14th, N. W.; 36 m., 16th, S. W.; 53 m., 22d, W.N.W.; 49 m., 24th, N.; 56 m., 27th, S.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.06	29.92	30.035	43.0	2 P	27.0	6 A	35.0	33.9	29.7	7.5
2	30.17	30.05	30.132	36.5	2 P	24.0	12 P	30.3	29.7	25.0	8.0
3	30.36	30.16	30.299	35.0	3 P	18.0	12 P	26.5	25.7	21.7	8.0
4	30.33	29.47	29.880	34.0	3 P	15.5	4 A	24.7	26 2	25.0	0.0
5	30.13	29.46	29.890	35.0	3 A	10.0	12 P	22.5	18.6	12.7	8.7
6	30.13	29.98	30.067	32.5	4 P	9.0	2 A	20.7	19.0	17.5	8.0
7	30.01	28.88	29 533	40.0	12 P	11.0	8 A	25.5	23.0	22.5	0 0
8	29.64	28.86	29.444	43.0	1 A	32.0	12 P	37.5	36.2	31.7	4.0
9	30.06	29.62	29.855	35.0	2 P	17.0	12 P	26.0	26.2	22.5	3.5
10	30.44	30.06	30.354	27.0	3:30 P	14.5	2 A	20.7	18.0	14.5	8.5
11	30.47	30.16	30.382	35.0	3 P	12.0	8 A	23.5	21.7	18.3	6.0
12	30.16	29.09	29 418	39.0	1 P	25.0	5 A	32.0	34.5	35.7	0.0
13	29.43	29.09	29.292	44.0	2 P	30.0	12 P	37.0	36.7	32.3	2.5
14	30.05	29.43	29.810	30.0	0 A	17.0	12 P	23.5	24.6	20,3	7.5
15	30.27	30.03	30.191	34.0	3 P	13.5	6 A	23.7	23.9	20.5	7.0
16	30.15	29.72	29.927	38.0	3 P	17.0	12 P	27.5	31.0	26 3	0.0
17	30.31	30.01	30.194	34.0	3 P	13 0	6 A	23.5	22.6	18.0	8.5
18	30.07	29.93	29.991	35.0	3 A	27.5	0 A	31.3	30.7	26.5	5.0
19	30 59	29.94	30.348	35.0	3 A	9 0	12 P	22.0	25.8	20.0	8.5
20	30.59	30.10	30.345	39.0	4 P	6 5	6 A	22.7	22.9	22.0	2.1
21	30.15	29.80	30.030	53.0	2 P	30.5	0 A	41.7	40.2	33.5	7.0
22	30.08	29.65	29.837	50.0	10 A	31.0	12 P	40.5	39.9	33.0	7.0
23	30.19	29.99	30.138	32.0	3 P	23.5	8 A	27.7	28 0	24.0	0.0
24	30.02	29.76	29.919	25.5	0 A	15.5	7 A	20.5	18.3	16.3	0.0
25	29.79	29.67	29.974	28.0	11:30 P	3.5	7 A	15.7	18.2	14.6	1.8
26	29.93	29.35	29.808	42.0	12 P	20 0	6 A	31.0	31.3	28.3	6.0
27	29.76	29.00	29.373	45.5	5:30 A	18.0	12 P	31.7	32.1	29.0	2.0
28	30.03	29 76	29.948	32.0	9 P	13.0	7 A	22.5	22.7	20.0	7.5
29	30.13	29.86	29.989	32.0	9 A	8.0	12 P	20.0	25.5	24.0	1.0
30	30.44	30.13	30.361	9.0	3 P	−2.0	7 A	3.5	2.0	-1.7	9.0
31	30.56	30 33	30.510	21.0	4 P	−5.5	7 A	7.7	6.9	3.5	9.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	23 5	.188	71.0	W.	292	3.5	26	11 P				
2	18.5	.153	66.5	N.N.W.	216	2.5	22	2 P				
3	16.5	.128	74.5	N.W.	126	1.5	17	3 P				
4	22.0	.148	78.5	S.S.W.	274	6.5	36	12 P	2:30 P	8 P	.06	T
5	3.0	.140	59.0	W.N.W.	466	12.5	50	4 A				
6	14.0	.106	81.5	S.S.W.	127	0.0	—	—				
7	20.0	.142	86.0	N.W.	140	6.5	36	7 P	12 M	12 P	.74	T
8	27.5	.197	76.5	S.W	333	6.0	35	11 A	0 A	4 A	.08	
9	18.0	.132	78.0	N.W.	118	3.0	24	3 P	6 A	9 A	.02	T
10	7.0	.095	65.5	W.N.W.	136	1.5	17	10 A				
11	14.0	.113	79.0	N.W.	40	0.5	10	4 P				
12	34.0	.219	89.0	N.N.E.	184	4.0	28	8 A	6 A	11 P	.66	
13	27.0	.204	75 5	W.	166	1.5	17	8 P				
14	13.5	.125	68.0	N.W.	320	8.0	40	3 P				
15	14 0	.128	70.0	S.W.	161	3.5	26	8 A	10 A	10:30A		T
16	19 5	.164	69.5	S.W.	385	6.5	36	7 P	2:30 P		T	
17	10.0	.113	66.0	S.S.W.	204	3.0	24	10 P				
18	20.5	.188	67.5	W.N.W.	272	4.0	28	2 P				
19	11 0	.132	60.5	N.W.	322	5.5	33	3 P				
20	17 0	.145	75.5	S.S.W.	174	2.5	22	3 P				
21	28.0	.220	73.0	S.	146	3.0	24	11 P				
22	27.5	.217	69.0	W.	413	14.0	53	2 P	3 P	3:30 P	.01	
23	18.5	.142	73.5	E.	151	3.0	24	1 A	10 A	12 P		T
24	11.5	.100	79.5	N.	445	12.0	49	2 P	0 A	12 M	.08	1
25	9 5	.095	79.0	W.	241	4.5	30	1 A				
26	23.0	.175	77.0	S.	244	3.0	24	4 P	10 P	12 P	.03	
27	25.5	.183	81.5	W.	473	16.0	56	9 A	0 A	11 A	.53	T
28	13.0	.128	69.0	S.W.	379	5.0	32	1 A	6 P	12 P		T
29	21.0	.143	82.5	N.W.	343	3.5	26	9 P	0 A	10 A	.04	$\frac{1}{2}$
30	−11.0	.043	65.0	N.N.W.	362	4.5	30	2 P				
31	−7.0	.058	60.0	W.N.W.	117	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS.

The weather during January, like that of the previous month was warmer than usual, although the departure from the mean was smaller. A large wind movement, large fluctuations in the barometer and a very small snowfall were other features that were prominent.

An analysis of the records shows the following as the more important characteristics: The mean barometer was below the normal, the maximum was lower than any previous January maximum at this station excepting the record for 1896, the minimum was the lowest since 1891. Three very marked periods of low pressure were noted, culminating on the 8th, 12th and 27th. The range was considerably larger than usual.

The maximum, minimum and mean temperatures were all from two and one-half to three degrees higher than the average. The records show four years with a higher mean temperature for January during the past 18 years.

The mean dew point and relative humidity were both below the normal.

The total precipitation was about two-thirds the normal amount and scarcely any of it was snow.

The total wind movement was larger than any previous January record here. The excess over the normal was about 3000 miles. On more than half the days the daily record exceeded 240 miles; a very unusual feature here. The only wind record for any month since the establishment of the station showing a greater total movement is that of March, 1896, when 8,182 miles was registered.

The amount of sunshine was considerably greater than usual.

J. E. OSTRANDER Meteorologist.

T. A. BARRY, Observer.

BULLETIN No. 230. FEBRUARY, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.49, 9th, 8 A.
Minimum reduced to freezing,	28.63, 1st, 4 P.
Reduced† maximum reading,	30.83, 9th, 8 A.
Reduced† minimum reading,	28.94, 1st, 4 P.
Mean semi-daily reduced,	30.082
Monthly range,	1.89

****Air Temperature.*** In Degrees Fahr.

Highest,	56.0, 15th, 3 P
Lowest,	-12.0, 5th, 7 A.
Mean hourly,	20.5
Mean of means of max. and min.,	20.6
Mean sensible (wet bulb),	17.7
Monthly range,	68.0
Highest mean daily,	46.5, 15th
Lowest mean daily,	0.3, 5th
Mean maximum,	30.4
Mean minimum,	10.8
Mean daily range,	19.6
Greatest daily range,	42.0, 25th
Least daily range,	8.5, 13th, 19th

Humidity.

Mean dew point,	14.7
Mean force of vapor,	.116
Mean relative humidity,	84.8

Precipitation. In inches.

Total precipitation,	3.53
Number of days on which .01 inch or more rain or melted snow fell,	9
Total snow, in inches,	20

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5511m.
Greatest daily movement,	594 m., 2nd
Least daily movement,	41m., 25th
Mean daily movement,	190 m.
Mean hourly velocity,	7.9 m

Maximum pressure per square foot, 23.0 lbs.= 68 m. per hour, 2nd, 12M., N. W.

Maximum velocity for 5 minutes, 42 m. per hour 2nd, 12M., N. W.

Prevailing Direction, Northwest.

Summary.

North,	17 per cent.
Southwest,	17 " "
North Northwest	17 " "
Southeast	10 " "
Other directions,	39 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	106 hrs.=35 per cent.
Number of clear days,	15
Number of fair days,	8
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, . . 200 hrs.=65%

Rain, 1st, 6th, 13th, 14th, 15th, 19th, 26th

Snow, 1st, 2nd, 5th, 6th, 19th, 23d, 26th

Sleet, 1st, 26th.

Days Sleighing, 19

Gales, 35 miles or more per hour., 68 m, 2nd, N. W.; 38 m., 4th, N. N. W.; 51 m., 7th, N. N.W.; 40 m., 8th, N. N. W.; 47 m., 15th, S. W.:

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.33	28.94	29.475	38.0	2 P	10.0	0 A	24.0	24.0	23.7	0.0
2	29.94	29.19	29.683	27.0	0 A	9.0	12 P	18.0	15.0	12.3	5.5
3	30.13	29.90	30.003	22.5	4 P	6.0	5 A	14.3	13.5	13.3	8.0
4	30.59	30.13	30.492	12.0	4 P	−7.0	7:30 A	2 5	1.1	−3 7	10.0
5	30.70	30.29	30.567	10.0	4 P	−12.0	7 A	−1.0	0 3	−1.3	8.0
6	30.29	29.72	29.887	28.0	5 P	8.0	0 A	18.0	20.5	21.3	2.0
7	30.18	29.84	30,026	27.0	0 A	9.0	12 P	18.0	16.5	15.0	7.5
8	30.58	30.17	30.418	11.0	3 P	−3 0	12 P	4.0	4.7	1 0	10.0
9	30.83	30.58	30.795	22.0	3 P	−10.0	6 A	6.0	4.3	2.5	10.0
10	30.80	30.54	30.688	26.0	4 P	−7.5	7 A	9.3	17.1	7.5	10.0
11	30.60	30.42	30.484	45.0	4 P	6.0	7 A	25.5	23.3	18.3	10.0
12	30.78	30 60	30.700	33.0	2 P	10.0	7 A	21.5	22.8	17.3	9.0
13	30.61	30.20	30.393	35.5	6 P	27.0	0 A	31.3	31.0	31.3	0.0
14	30.20	29.65	30.033	44.0	3 P	33.0	7 A	38.5	37.7	37.0	6.5
15	29.65	28.96	29.200	56.0	3 P	39.0	12 P	47.5	46.5	46 5	0.0
16	29 78	29.11	29.642	39.0	0 A	27.0	12 P	33.0	31.5	26 5	8.0
17	30 12	29.78	29.944	32.0	0:30 P	19 0	12 P	25.5	24.7	21.7	5.0
18	30.42	30.12	30.263	25.0	3 P	14.0	7 A	19.5	18.2	15.3	10.0
19	30.38	29.59	29 977	24.5	5 P	16.0	0 A	20.3	19 9	19 5	0.0
20	30 06	29.59	29.805	33.5	2 P	17.0	12 P	25.3	23.8	18.7	10.0
21	30.09	29.87	29.999	35.0	4 P	7.0	6 A	21.0	22.7	21.7	10.2
22	29.91	29.79	29.859	31.5	2 P	14.0	12 P	22.7	23.0	18.0	8 0
23	29 92	29.82	29.894	24.5	2 P	−1.0	7 A	11.7	13.9	9 0	8 0
24	30.45	29.90	30.276	32.0	4 P	5.0	7 A	18.5	16.7	11.7	10.2
25	30 52	30.25	30.406	36.0	4 P	−6.0	7 A	15.0	16.2	13.3	10.2
26	30.25	29.71	29.885	38.0	3 P	26 0	6 A	32.0	31.7	29 7	0.0
27	29.71	29.53	29.603	41.0	2:30 P	29.0	12 P	35.0	35 3	32.7	5.0
28	29.96	29.61	29.829	26.5	3 P	16.5	8 A	21.5	21.5	17.0	8.9
29	30.33	29 96	30.147	25.5	5 P	13.0	12 P	19.3	18.0	15 5	10.1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	20 5	.145	84 0	S.W.	148	4.0	28	3 P	4 A	7 P	.86	3
2	8.0	.083	79 0	W.	594	23 0	68	12 M	8 A	9 A		T
3	9 0	.086	79.0	S.W.	268	2 0	20	12 P				
4	−8 5	.038	77.5	N.W.	218	7.0	38	1 A				
5	−3.5	.047	87.0	N.N.W.	151	4.0	28	3 A	8:30 P	12 P	.10	1
6	18.5	.121	86.5	W.N.W.	124	0.0	—	—	0 A	9 P	.33	3½
7	11.0	.095	77.5	W.	361	13.0	51	7 P				
8	−3.0	.049	81.0	N.N.W.	321	8.0	40	12 M				
9	−1.5	.052	82.5	N.N.E.	134	2.0	20	1 P				
10	6 0	.076	89.5	W.N.W.	54	1.0	14	3 P				
11	15.5	.116	88.0	S.E.	62	0.5	10	11 P				
12	15 5	.105	90.0	N.E.	79	0.5	10	3 A				
13	30.0	.176	97.5	S.W.	197	2.0	20	4 P	0 A	12 P	.04	
14	36.5	.224	98.0	S.W.	48	0.5	10	3 P	0 A	12 P	.16	
15	45.5	.326	95.0	S.S.W.	371	11.0	47	3 P	0 A	5 P	.04	
16	20 5	.161	70.0	N.N.W.	346	5.0	32	5 A				
17	17 5	.127	77.5	N.N.W.	129	2.0	20	6 P				
18	11.5	.095	81.0	N.	226	3.5	26	6 A				
19	17.5	.111	87.0	N.N.E.	125	4.5	30	10 P	6 A	10 P	.78	6
20	16 0	.112	82.5	N.	212	3.0	24	5 P				
21	18.5	.099	84.0	W.S.W.	142	1.0	14	1 A				
22	16.0	.105	86.5	N.	166	2.0	20	3 P				
23	6.0	.075	87.0	S.W.	70	0.5	10	3 P	3:30 P	11 P	.04	½
24	8.0	.080	81.5	N.E.	136	2.5	22	2 P				
25	10 0	.101	85.5	S.E.	41	0.0	—	—				
26	28 5	.169	94.5	S.E.	127	1.5	17	6 P	2 A	11 P	1.18	6
27	29.0	.201	81.0	N.	199	2.0	20	4 P				
28	15.0	.100	86.5	N.	270	2.0	20	3 A				
29	12.5	.094	84.0	N.N.W.	192	4.5	30	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during February proved to be the most seasonable of the winter. Clear, cold weather predominated and the temperature fell below zero on a number of dates. Some of the changes in temperature and pressure were unusually rapid.

The records show the following as the most important features for the month: The mean barometer was higher than the normal and the range unusually large. The fall of 1.4 in. on the 1st and the recovery of 1 in. by the end of the 2nd showed an activity rarely seen at this station. The range for the month was practically equal to the mean annual range for the station. The total wind movement was the largest for February since 1896. The daily wind movement of 594 miles on the 2nd, following the sudden drop in pressure, was one of the largest records ever made here. A number of gales occurred during the first half of the month.

The mean temperature was nearly three degrees below the normal. The maximum was high and the minimum low, giving a range about eight degrees more than usual. A rise in temperature of 42 degrees in 9 hours occurred on the 25th.

The mean dew point was considerably lower than the normal ,and the relative humidity, 8 per cent higher than usual. The high humidity taken in connection with the large amount of sunshine and clear weather, gives an unusual condition in meteorology here. The amount of sunshine was about a third more than the average, partly accounted for by the extra day in the month.

J. E. OSTRANDER, Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 231. MARCH, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.27, 10th, 8 A.
Minimum reduced to freezing,	29.07, 15th, 7 P.
Reduced† maximum reading,	30.59, 10th, 8 A.
Reduced† minimum reading,	29.37, 15th, 7 P.
Mean semi-daily reduced,	30.104
Monthly range,	1.22

****Air Temperature.*** In Degrees Fahr.

Highest,	67.0, 27th, 1.30 P
Lowest,	5.0, 1st, 6 A.
Mean hourly,	34.7
Mean of means of max. and min.,	34.8
Mean sensible (wet bulb),	31.2
Monthly range,	62.0
Highest mean daily,	53.0, 27th
Lowest mean daily,	19.0, 1st
Mean maximum,	44.5
Mean minimum,	25.3
Mean daily range,	19.2
Greatest daily range,	32.0, 26th
Least daily range,	6.5, 20th

Humidity.

Mean dew point,	26.9
Mean force of vapor,	.205
Mean relative humidity,	77.9

Precipitation. In inches.

Total precipitation,	2.86
Number of days on which .01 inch or more rain or melted snow fell,	13
Total snow, in inches,	4.5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5759m.
Greatest daily movement,	421m., 26th
Least daily movement,	44m., 18th
Mean daily movement,	186 m.
Mean hourly velocity,	7.7 m

Maximum pressure per square foot, 10.0 lbs.= 45 m. per hour, 15th, 3P., S. W.

Maximum velocity for 5 minutes, 33 m. per hour 16th, 4P., N. N. W.

Prevailing Direction, Northwest.

Summary.

North,	13 per cent
Southwest,	19 " "
North Northeast	10 " "
Northwest	10 " "
North Northwest	19 " "
Other directions,	29 " "

Weather.

Mean cloudiness observed,	48 per cent.
Total cloudiness recorded by the Sun Thermometer,	151 hrs.=41 per cent.
Number of clear days,	13
Number of fair days,	9
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, 220 hrs.=59%

Rain, 2d, 6th, 7th, 8th, 15th, 18th, 19th, 23d, 24th, 27th, 28th, 29th, 31st.

Snow, 1st, 8th, 17th, 18th.

Sleet, 18th.

Days Sleighing, 4.

Gales. 35 miles or more per hour.. 35 m 7th, N.N.W.: 35m.. 10th, N. W.: 45m., 15th, S.W.: 40 m., 24th, N. N. W.: 35 m., 26th, W. S.W.

Thunder and Lightning—15th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.42	30.21	30.335	29.0	3 P	5.0	6 A	17.0	19.0	16.3	6.0
2	30.21	29.94	30.028	34.0	4 P	23.0	0 A	28.5	29.9	30.0	0.0
3	30.39	30.03	30.235	34.0	4 P	23.0	12 P	28.5	30.6	28.7	10.0
4	30.48	30.39	30.459	35.0	3 P	13.5	6:30 A	24 3	24.3	21.7	11.0
5	30.46	30.32	30.413	37.5	3 P	12.0	6 A	24.7	23.1	21.0	11.0
6	30.35	29.85	30.170	31.0	12 P	13.0	5 A	22.0	23.2	23.5	0.2
7	30.20	29.65	29 870	39.0	12 M	31.0	0 A	35.0	33.8	31.0	0.0
8	30.37	30.20	30.316	42.5	2 P	22.0	7 A	32.3	32.7	30.3	8.5
9	30.46	30.19	30.295	39.0	12 M	19.0	12 P	29.0	32.1	29.5	6.8
10	30.59	30.43	30.536	29.0	3 P	10.0	7 A	19.5	20.4	18.5	11.0
11	30.43	29.84	30.081	50.0	4 P	20.0	1 A	35.0	35.4	34.3	8.2
12	30.08	29.82	29.933	54.0	3 P	33.0	7 A	43.5	42.0	36.3	10.0
13	30.17	29.74	30.009	51.5	3 P	28.0	6 A	39.5	38.9	35.5	6.5
14	29.91	29.72	29.856	56.5	4 P	35.0	12 P	45.7	43.2	36.3	11.0
15	29.91	29.37	29.603	58.0	1 P	34.0	1 A	46.0	44.5	40.5	3.0
16	30.05	29.60	29.864	45.5	2 P	23.5	12 P	34.5	35.5	28 7	9.0
17	30.08	29.99	30.052	29.5	12 M	18.5	6 A	24.0	24.2	22.7	4.0
18	30.19	30.00	30.108	33.0	1 P	20.0	5 A	26.5	28.2	27.5	2.0
19	30.14	29.78	29 938	45.0	4 P	30.0	12 P	37.5	34.0	30.0	5.5
20	30.30	30.13	30.262	30.5	3 P	24.0	7 A	27.3	27.5	22.5	10.5
21	30.31	30.26	30.299	42.0	5 P	15.0	6:30 A	28.5	28.5	24.7	12.0
22	30.34	30.02	30.167	47.5	3 P	26.0	5 A	36.7	37.0	32.7	11.5
23	30.02	29.49	29.753	54.0	1 P	37.0	0 A	45.5	43.8	41.7	5.0
24	29.87	29.48	29.648	55.0	1 P	36.0	6 A	45.5	44.9	39.0	10.5
25	30.42	29.87	30.309	38.0	0 A	26.0	8 A	32.0	30.8	24.7	12.0
26	30.43	30.07	30.226	61.0	3 P	29.0	0 A	45.0	46.2	41.3	7.6
27	30.24	30.07	30.187	67.0	1:30 P	44.0	12 P	55.5	53 0	47.7	8.5
28	30.22	29.86	29 976	63.0	4 P	37.5	6 A	50.3	47.5	46.7	3.2
29	30.08	29.79	29.901	51.0	0 A	35.0	12 P	43.0	43.7	39.0	0.0
30	30.35	30.08	30.312	48.0	2 P	30.5	6 A	39.3	38 4	32.3	12.0
31	30.33	29 91	30.077	48.0	1 P	29 5	4 A	38.7	38.0	33.5	4.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	14 0	.100	89.5	N.N.W.	71	1.0	14	5 P	4 P	12 P	.35	3
2	28.0	.171	92.0	N.E.	56	0.0	—	—	0 A	11 A	.63	
3	26.0	.164	89.0	N.	228	3.0	24	1 P				
4	17.0	.124	80.5	N.N.W.	133	1.0	14	12 P				
5	17.5	.122	83.5	N.N.E.	67	1.5	17	12 M				
6	22.5	.133	94.5	N.N.E.	69	2.5	22	12 M	11 A	12 P	.28	
7	28.5	.185	85.0	N.N.W.	248	6.0	35	2 P	0 A	2 P	.02	
8	29.0	.173	94.5	W.	122	0.5	10	6 P	6 P	11 P	.03	T
9	32.0	.171	88.5	N.E.	191	5.5	33	4 P				
10	14.0	.110	78.5	N.W.	211	6.0	35	5 P				
11	32.0	.226	86.5	W.S.W.	238	3.0	24	3 P				
12	31.5	.225	78.5	S.W.	119	0.5	10	4 P				
13	29.5	.284	74.0	S.S.W.	103	2.5	22	6 P				
14	37.0	.304	73.0	N.W.	166	3.0	24	2 A				
15	34.5	.293	72.0	S.W.	265	10.0	45	3 P	2:30 P	8 P	.12	
16	18.0	.187	56.0	N.W.	408	5.5	33	6 P				
17	17 0	.135	73.0	W.	146	0.5	10	1 P	1 P	5 P	.12	½
18	23.5	.160	83.0	E.	44	0.0	—	—	12 M	12 P	.30	1
19	25.0	.182	77.5	N.	136	3.0	24	11 P	0 A	9 A	.30	
20	11.0	.145	53.0	N.N.E.	246	3.5	26	4 A				
21	16.5	.155	63.0	N.N.W.	113	0.5	10	6 P				
22	28.0	.206	76.5	W.S.W.	323	5.0	32	12 M				
23	38.0	.281	82.5	S.W.	190	1.0	14	3 P	1 P	12 P	.31	
24	33 0	.280	68.0	N.N.W.	223	8.0	40	12 M	0 A	4 A	.02	
25	18.0	.150	68.5	N.	235	4.0	28	9 A				
26	37.0	.311	76.0	S.W.	421	6.0	35	4 P				
27	44.5	.372	80.5	S.E.	226	3.0	24	4 A	3:30 P		T	
28	46.0	.343	95.0	S.W.	138	1.0	14	6 P	5 A	12 P	.05	
29	34 0	.269	75.5	N.	114	3.0	24	11 P	0 A	5 P	.33	
30	22.5	.222	55.0	N.N.W.	317	3.5	26	3 A				
31	29.0	.216	73.5	S.W.	192	2.0	20	3 P	2 P	6 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during March was generally seasonable, and most of the transition from winter to spring was effected. The snow disappeared early in the month, and a light snowfall near the middle of the month was quickly melted. At the close of the month the frost was out of the ground in places, and some of the roads well settled.

The mean barometer was well above the normal, and the maximum and minimums both slightly lower than the average.

The mean temperature was slightly higher than usual, and the maximum about six degrees higher than the average of the March maximums. The minimum was practically normal, giving a very large range for the month.

The mean dew point was nearly normal, and the relative humidity about four per cent. greater than usual.

The total precipitation was about seventy per cent. of the normal, and but little of it occurred as snow.

The total wind movement was above the average, but the gales recorded were of only moderate intensity.

The amount of bright sunshine recorded was considerably in excess of the average.

A thunder storm occurred on the 15th, and a fine auroral display on the night of the 26th.

J. E. OSTRANDER, Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 232. APRIL, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.21, 14th, 8 A. 17th, 8 A.
Minimum reduced to freezing, 28.88, 30th, 12 P.
Reduced† maximum reading, 30.52, 14th, 8 A. 17th, 8 A.
Reduced† minimum reading, 29.17, 30th, 12 P.
Mean semi-daily reduced, ... 29.92†
Monthly range, ... 1.35

****Air Temperature.*** In Degrees Fahr.

Highest,	84.0, 23rd, 4 P
Lowest,	18.0, 17th, 6 A.
Mean hourly,	45.1
Mean of means of max. and min.,	45.9
Mean sensible (wet bulb),	39.0
Monthly range,	66.0
Highest mean daily,	68.7, 26th
Lowest mean daily,	26.7, 4th
Mean maximum,	57.3
Mean minimum,	34.5
Mean daily range,	22.8
Greatest daily range,	39.5, 23rd
Least daily range,	8.0, 8th

Humidity.

Mean dew point,	31.9
Mean force of vapor,	.313
Mean relative humidity,	64.3

Precipitation. In inches.

Total precipitation,	1.97
Number of days on which .01 inch or more rain or melted snow fell,	14
Total snow, in inches.	

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	8208m.
Greatest daily movement,	543m., 12th
Least daily movement,	127m., 17th
Mean daily movement,	274 m.
Mean hourly velocity,	11.4 m

Maximum pressure per square foot, 32.0 lbs.= 80 m. per hour, 11th, 6P., N. N. W.

Maximum velocity for 5 minutes, 40 m. per hour 11th, 6P., N. N. W.

Prevailing Direction, West Northwest.

Summary.

Northwest	17 per cent
West,	17 " "
North Northwest	17 " "
South	13 " "
West Southwest,	10 " "
Other directions,	26 " "

Weather.

Mean cloudiness observed, ... 42 per cent.

Total cloudiness recorded by the Sun Thermometer, ... 125 hrs.=31 per cent.

Number of clear days, ... 18

Number of fair days, ... 5

Number of cloudy days, ... 7

Bright Sunshine.

Number of hours recorded. . . 277 hrs.=69%

Rain, 2d, 5th, 6th, 8th, 9th, 10th, 11th, 13th, 15th, 18th, 19th, 20th, 23th, 28th, 30th

Snow, 2d, 3d, 5th, 11th, 13th, 20th.

Sleet, 8th, 15th.

Gales, 35 miles or more per hour.. 41 m., 2d, N..: 40 m., 3d, N. N. W.: 45m., 4th, W. N. W.: 67 m.. 9th, W. N. W.: 80 m., 11th, N. N. W.; 55 m., 12th, N. N. W.; 36 m., 13th, N.: 49 m., 15th, N. E.: 40 m., 16th, N. N. E.: 38 m., 20th, N.; 45m., 21st, N. N. W.: 41 m., 30th, S. S. E.

Thunder and Lightning—8th, 23d, 28th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.10	29.89	30.041	50.0	4 P	34.0	5 A	42.0	39.7	33.0	12.0
2	29.98	29.46	29.573	47.0	1 P	31.0	12 P	39.0	36.1	30.0	7.0
3	29.89	29.59	29 781	35.0	3 P	24.5	12 P	29.7	29.3	22.3	11.0
4	30.29	29.85	30.079	33.5	5 P	21.0	6 A	27.3	26.7	22.3	12.5
5	30.39	30.01	30.248	51.0	2:30 P	19.0	6 A	35.0	34.2	27.7	10.0
6	30.10	29.92	30.033	63.0	4 P	34.0	0 A	48.5	47.0	41.0	11.5
7	30.30	30.07	30.151	63.5	2 P	41.0	6 A	52 3	51.1	44.0	10.5
8	30.35	29.63	30.038	43.0	0 A	35 0	12 P	39.0	38.4	34.7	0.0
9	30.25	29.63	30.047	51.0	4 P	32.5	12 P	41.7	40.2	31.7	12.0
10	30.24	29.70	30.012	56.0	1 P	26.5	6 A	41.3	41.1	37.3	9.3
11	29.70	29.35	29.552	57.5	12 M	36.0	12 P	46.7	43.7	38.0	5.5
12	30.08	29 66	29.963	46.5	4 P	33.5	6 A	40.0	39.0	30.7	12.0
13	30.29	29.85	30.015	51.0	4 P	31.0	3 A	41.0	39.0	32.0	8.0
14	30.52	30.29	30.431	57.0	4 P	23.0	6 A	40.0	40.0	33.7	13.0
15	30.30	29.83	29.988	55.5	11 A	34.5	1 A	45.0	45.3	43.5	2.0
16	30.51	30.02	30.397	40.0	3 P	25.5	6 A	32.7	32.0	24.7	13.0
17	30.52	30.25	30.396	53.0	4 P	18.0	6 A	35.5	36.2	32.5	13.0
18	30.25	29.51	29.882	56.0	2 P	31.0	3 A	43.5	44.4	41.5	5.8
19	29.59	29 38	29.501	58.5	11 A	39.0	12 P	48.7	47.5	40.0	4.5
20	29.66	29.51	29 598	41.5	7 P	28 5	6 A	35.0	36.5	34.0	2.5
21	29.89	29 65	29 830	46.0	5 P	22.0	4 A	34.0	35.5	31.3	13.2
22	30.01	29.74	29.867	64.0	5 P	35.0	3 A	49.5	49.2	41.5	12.0
23	29.83	29.65	29.785	84.0	4 P	44.5	4 A	64.3	63.9	54.3	11.0
24	29 96	29.82	29.946	71.5	3 P	48.0	6 A	59.7	57.4	49.5	13.0
25	29.97	29.62	29.793	67.0	4 P	43.0	4 A	55.0	53.7	52.3	3.3
26	29.77	29.61	29.733	81.0	4 P	56.0	4 A	68.5	68.7	61.0	10.9
27	29.81	29.65	29.715	83.0	12 M	51.0	5.30 A	67.0	66.2	59.0	10.9
28	29.74	29.57	29.653	74.5	4-30 P	53.0	12 P	63.7	60.5	55.7	7.0
29	29.92	29.73	29.870	65.0	4 P	44.0	6 A	54.5	55.2	48.5	11.1
30	29 93	29.17	29.707	74.0	3 P	41.0	4 A	57.5	55.3	43.5	9.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	24.0	.226	59.5	N.	214	5.0	32	9 A				
2	23.0	.188	68.0	N.W.	336	8.5	41	10 P	2 A	10 A	.13	T
3	7.5	.149	43 5	N.N.W.	527	8.0	40	9 A	4 A	6 P		T
4	14.0	.140	61.0	W.	435	10.0	45	11 A				
5	23.5	.170	78.5	S.	237	4.0	28	6 P	8:30 P	12 P	.09	T
6	33.5	.312	66 0	W.N.W.	243	2.0	20	12 M	0 A	2 A	.22	
7	34 5	.376	54.5	W.	208	1.5	17	5 P				
8	31.0	.223	78.5	N.E.	149	5.0	32	11 P	6 A	12 P	.61	
9	21.0	.222	52 0	W.N.W.	439	22.5	67	3 A	0 A	2 A	.05	
10	33.0	.252	75.0	S.	232	5.0	32	3 P	4 P	12 P	.01	
11	32.0	.318	71.0	N.N.W.	428	32.0	80	6 P	0 A	11 P	T	T
12	17.0	.220	45.0	N.N.W.	543	15.0	55	3 P				
13	21.5	.221	54.5	N.W.	258	6.5	36	5 P	9 A	11 A	.01	T
14	23.0	.247	51.0	W.	202	4.5	30	9 P				
15	38.5	.336	69.5	W.S.W.	370	7.5	39	12 P	11 A	5 P	.38	
16	11.0	.172	44.0	N.E.	459	8.0	40	12 M				
17	24.0	.219	62.5	W.	127	2.5	22	6 P				
18	39.5	.281	87.5	W.S W.	273	4.5	30	3 P	3 P	12 P	.03	
19	33.5	.307	39.0	N.N.W.	257	5.5	33	6 P	0 A	3 A	.03	
20	25.5	.234	60.0	W.	191	7.0	38	11 P	10 A	3 P	.01	T
21	20.5	.220	51.5	N.N.W.	397	10.0	45	9 A				
22	30.5	.354	49.5	N.W.	285	4.0	28	12 M				
23	48.0	.556	61.0	S.W.	176	3.5	26	12 M				
24	43.0	.458	62.5	S.E.	193	2.0	20	3 A				
25	50 5	.434	87.5	S.W.	135	4.0	28	10 P	10 P	11 P	.06	
26	56.5	.673	70.5	N.W.	272	5.5	33	10 A				
27	55.0	.594	75.0	W.S.W.	183	3.5	26	4 P				
28	54.5	.473	90.0	S.	138	5.5	33	8 P	2 A	8 P	.12	
29	44.0	.400	73.5	N.W.	130	2.5	22	2 P				
30	43.0	.423	66.5	S.	171	8.5	41	12 P	6:30 P	11:30P	.22	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather conditions prevailing during April were generally seasonable, although the departure from the normals for some of the elements was unusually large. The most noticeable of these were the wind movement, sunshine and precipitation records. At the close of the month the seasonal advance was slightly ahead of average conditions.

The records show the following features of interest: The mean barometer was below the normal and the range considerably larger than usual. The minimum barometer was the lowest April record since 1891.

The mean temperature was practically normal; the maximum was about 5 degrees higher than usual, while the minimum was 3 degrees lower than usual, giving an unusually large range for the month. The maximum record has only been exceeded twice in April since this station was established, and the minimum was the lowest record since 1898. Four dates have a mean hourly temperature above 60 degrees.

The mean dew point and relative humidity were both lower than usual.

The total precipitation was small, being about two-thirds of the mean. All of the rain storms were comparatively light.

The total wind movement was the most marked feature of the month. The record was the largest for any month since the establishment of the station. On half of the dates the daily records exceeded 240 miles, or an average of 10 miles per hour. Most of the gales were from the northwest quadrant.

The percentage of sunshine was large, giving an unusually large number of clear days.

J. E. OSTRANDER, Meteorologist

T. A. BARRY, Observer.

BULLETIN No. 233. MAY, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.02, 22d, 10 A
Minimum reduced to freezing,	28.90, 1st, 3 A.
Reduced† maximum reading,	30.31, 22d, 10 A.
Reduced† minimum reading,	29.20, 1st, 3 A.
Mean semi-daily reduced,	29.955
Monthly range,	1.11

****Air Temperature.*** In Degrees Fahr.

Highest,	88.5, 26th, 4 P
Lowest,	33.5, 5th, 5 A.
Mean hourly,	59.2
Mean of means of max. and min.,	59.9
Mean sensible (wet bulb),	53.9
Monthly range,	55.0
Highest mean daily,	74.5, 27th
Lowest mean daily,	43.7, 7th
Mean maximum,	70.2
Mean minimum,	48.9
Mean daily range,	21.3
Greatest daily range,	41.0, 11th
Least daily range,	8.0, 7th

Humidity.

Mean dew point,	50.1
Mean force of vapor,	.526
Mean relative humidity,	74.8

Precipitation. In inches.

Total precipitation,	4.35
Number of days on which .01 inch or more rain or melted snow fell,	13

Wind.

Total movement,	5818m.
Greatest daily movement,	513m., 1st
Least daily movement,	74m., 15th
Mean daily movement,	188 m.
Mean hourly velocity,	7.8 m

Maximum pressure per square foot, 13.0 lbs.= 51 m. per hour, 2d, 6 P., S.

Maximum velocity for 5 minutes, 30 m. per hour 1st, 10 A., S. W.

Prevailing Direction, West.

Summary.

Southwest	16 per cent
West Southwest	13 " "
Northwest,	13 " "
Southeast,	10 " "
Northeast,	10 " "
Other directions,	38 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	171 hrs.=38 per cent.
Number of clear days,	12
Number of fair days,	13
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 282 hrs.=62%

Rain, 2d, 3d, 6th, 7th, 8th, 9th, 12th, 13th, 14th, 20th, 21st, 22d, 23d, 26th, 29th, 30th, 31st.

Hail, 2d.

Thunder and Lightning—2d, 22d, 26th. 29th. 31st.

Light Frost, 5th.

Gales, 35 miles or more per hour., 44 m. 1st. W. S. W.; 51 m., 2d., S.; 37 m., 10th, N. W.; 47 m., 12th, S. W.; 35 m., 13th, N. W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.77	29.20	29.507	58.0	0 A	40.0	12 P	49.0	48.1	41.7	7.1
2	29.80	29.56	29.687	61.0	4 P	37.0	4 A	49.0	47.1	44.3	7.5
3	29.95	29.57	29 735	57.0	4:30 P	35.5	2 A	46.3	45.4	40.5	4.5
4	30.02	29.89	29.978	62.0	2:30 P	35.0	5:30 A	48.5	49 8	45.3	12.3
5	30.17	30.02	30.076	67.0	4 P	33.5	5 A	50.3	52.7	47.0	13.5
6	30.26	30.17	30.245	61.0	11 A	40.0	4:30 A	50.5	50.5	44.0	8.8
7	30.22	29.83	30.023	49.0	11 A	41.0	4 A	45 0	43.7	40.7	1.0
8	29.83	29.51	29.629	52.0	4 P	41 0	2 A	46.5	46.5	44.5	1.0
9	29.51	29.32	29.430	56.0	1 P	43.0	12 P	49.5	49.0	45.5	0.0
10	29.71	29.36	29.566	56.0	2:30 P	40.0	6 A	48.0	47.7	43.0	9.5
11	29.83	29.79	29.789	80.0	4 P	39.0	1 A	59.5	62.0	56.0	12.6
12	29.83	29.62	29.760	83.5	3 P	61.0	4 A	72.3	71.1	58.5	13.3
13	30.18	29.80	30.058	72.0	1 P	57.0	12 P	64.5	65.7	59.3	13.5
14	30.23	30.13	30.199	57.0	0 A	41.0	12 P	49.0	48.7	45.7	0.0
15	30.29	30.21	30.253	63 0	2 P	39.5	4 A	51.3	52.3	48 5	10.5
16	30.20	30.09	30.167	73.0	4 P	47.5	6 A	60.3	59.6	53 5	13.0
17	30.12	29.92	30.032	74.5	4 P	52.0	4 A	63.3	62.3	55.5	11.0
18	30.06	29.95	30.063	83 0	5 P	46.5	5 A	64.7	65.6	59.7	14.5
19	30.11	29 99	30.051	74.0	2 P	50.0	5:30 A	62.0	61.6	57 0	14.0
20	30.07	30 00	30 089	66.5	6 P	53 0	6 A	59.7	60.2	57.3	6.2
21	30.29	30.07	30 225	76.0	3 P	61.0	3 A	68.5	66.6	62.3	2.8
22	30.31	30.26	29.298	73.0	12 M	63 0	4 A	68.0	66.3	63.3	6 0
23	30.29	30.15	30.218	77.0	4 P	62.0	4 A	69.5	67.8	62.0	9.0
24	30.25	30.13	30.163	83.0	3:30 P	57.0	5 A	70.0	70.4	61.5	14.0
25	30.29	30.13	30.213	80.0	3 P	50 0	5 A	65.0	66.4	57.7	13.5
26	30.13	29.78	29.903	88.5	4 P	55.0	4 A	71.7	69.0	60.7	9.5
27	29.86	29.73	29.771	85.0	3 P	64.0	4 A	74.5	74.5	68.3	14.2
28	30.12	29.86	30.060	72.5	4 P	55.5	5 A	64.0	64.1	59.0	14.0
29	30.11	29 92	30.021	76.5	5 P	52.5	4 A	64.5	61.8	59.3	6.3
30	29 93	29.41	29.726	78.0	2 P	64.0	4 A	71.0	69.5	67.0	9.1
31	29.78	29.46	29.684	83.5	3 P	61.0	12 P	72.3	70.4	64.5	10.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq. Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	36 0	.312	69.0	W.S.W.	513	9.5	44	4 P				
2	40.5	.322	81.0	W.S.W.	185	13.0	51	6 P	11 M	12 P	.68	
3	36 5	.285	76.0	W.	340	5.0	32	4 P	7 A	8 P	T	
4	39 0	.373	63.0	N.W.	104	3.0	24	8 P				
5	38 5	.430	55.0	W.N.W.	156	5.5	33	11 A				
6	37.5	.365	60.5	E.N.E.	181	2.5	22	5 P	8 P	12 P	.02	
7	37 0	.278	83.0	N.E.	219	4.0	28	5 P	0 A	12 P	1.16	
8	42 5	.312	87.5	N.E.	165	2.0	20	3 A	0 A	12 P	.22	
9	42.5	.345	79.5	W.S.W.	145	3.0	24	6 P	0 A	12 P	.16	
10	36 5	.344	63.5	N.W.	205	7.0	37	11 A				
11	50.0	.585	65.0	W.	243	5.5	33	2 P				
12	51.0	.684	56.0	S.W.	330	11.0	47	1 P	5:30 P	6:30 P	T	
13	57.5	.643	91 5	N.W.	233	6.0	35	1 P	9 P	12 P	T	
14	43 5	.334	84.0	N.	116	2.0	20	10 P	0 A	5 P	39	
15	44 5	.394	76.5	S.E.	74	0.0	—	—				
16	54 0	.614	69.5	S.W.	136	4.0	28	12 P				
17	50.0	.546	67.0	W.	240	4.5	30	3 P				
18	54.5	.656	66.0	S E.	126	2.5	22	7 P				
19	53.0	.563	72.5	S.W.	225	5.0	32	2 P				
20	54.5	.538	81.0	N.	80	1.0	10	3 A	4 A	12 P	.08	
21	60.5	.615	86.0	S.S.E.	96	0.0	—	—	0 A	12 P	.23	
22	62.0	.625	89.5	S.	179	1.5	17	3 P	0 A	12 P	.32	
23	58.5	.651	76.5	S.W.	167	3.0	24	3 P	0 A	7 A	.02	
24	56.5	.717	64.0	N.N.E.	127	3.0	24	12 M				
25	51 5	.633	61.0	W.N.W.	144	1.5	17	5 P				
26	58.0	.640	79.0	S.W.	232	4.0	28	8 P	9:30 P	12 P	.05	
27	65.0	.833	75.5	N.W.	222	2.0	20	11 A				
28	57.0	.675	83.0	S.E.	109	0.5	10	3 P				
29	57 0	.573	86.0	S.	172	2.0	20	9 P	6 A	2 P	T	
30	66 0	.702	91.5	N.E.	130	4.0	28	8 P	10:30A	12 P	.99	
31	61.0	.707	80 0	W.S.W.	224	3.0	24	12 M	6 P	6:30P	.03	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during May was generally seasonable. While the records for some of the weather elements showed considerable departures from the normals, the combined effect was not especially noticeable.

Comparing the records with those of previous years, the following features are noted: The mean barometer was practically normal while both the maximum and minimum were low. At times the change of pressure was rather rapid.

The mean temperature was about three degrees above the normal, and the maximum and minimum records were both high. The minimum temperature was above the freezing point, and only one frost occurred. It was light, and occurring early in the month, did practically no damage.

The mean dew point and the relative humidity were both high for May.

The total precipitation was about six-tenths of an inch more than usual and was well distributed throughout the month. A heavy thunder storm on the 2nd was accompanied by a small amount of hail and the lightning did some damage in the town.

The total wind movement was about thirty per cent greater than the normal, the record for the 1st being especially large for this station. All the gales were during the first half of the month

The amount of bright sunshine was considerably greater than usual.

J. E. OSTRANDER, Meteorologist

T. A. BARRY, Observer.

Errata. Bulletin No. 232, Minimum barometer readings on 1st page should read 28.98 and 29.27, and minimum for the 30th on 2nd page should read 29.27.

BULLETIN No. 234. JUNE, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.11, 6th, 8 A.
Minimum reduced to freezing,	29.47, 9th, 5 P.; 10th, 12 M.
Reduced† maximum reading,	30.40, 6th, 8 A.
Reduced† minimum reading,	29.75, 9th, 5 P.; 10th, 12 M.
Mean semi-daily reduced,	30.029
Monthly range,	0.65

****Air Temperature.*** In Degrees Fahr.

Highest,	91.5, 24th, 2:30 P.
Lowest,	36.0, 3d, 6 A.
Mean hourly,	67.6
Mean of means of max. and min.,	67.2
Mean sensible (wet bulb),	60.7
Monthly range,	55.5
Highest mean daily,	76.5, 20th
Lowest mean daily,	57.7, 3d
Mean maximum,	81.1
Mean minimum,	53.3
Mean daily range,	27.8
Greatest daily range,	38.0, 7th
Least daily range,	17.0, 29th

Humidity.

Mean dew point,	56.2
Mean force of vapor,	.672
Mean relative humidity,	66.2

Precipitation. In inches.

Total precipitation,	0.76
Number of days on which .01 inch or more rain or melted snow fell,	4

Wind.

Total movement,	4571m.
Greatest daily movement,	295m., 15th.
Least daily movement,	50m., 13th.
Mean daily movement,	152 m.
Mean hourly velocity,	6.3 m.
Maximum pressure per square foot,	7.0 lbs.= 37 m. per hour, 2d, 1 P., W.N.W.
Maximum velocity for 5 minutes,	24 m. per hour 9th, 6 P., S.
Prevailing Direction,	Southwest.

Summary.

Southwest	10 per cent
West Southwest	10 " "
Northwest,	10 " "
South Southeast,	10 " "
South,	23 " "
Other directions,	37 " "

Weather.

Mean cloudiness observed,	28 per cent.
Total cloudiness recorded by the Sun Thermometer,	95 hrs.=21 per cent.
Number of clear days,	22
Number of fair days,	6
Number of cloudy days,	2

Bright Sunshine.

Number of hours recorded, . . 362 hrs.=79%

Rain, 1st, 15th, 16th, 24th, 29th.

Thunder and Lightning—10th, 24th, 28th.

Very Light Frost, 3d.

Gales, 35 miles or more per hour., 37 m. 2d, W. N. W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.78	29.854	75.0	10 A	55.0	5:30 A	65.0	61.7	56.5	12.2
2	30.06	29 86	29.948	74.5	3 P	42.0	5 A	58.3	59.0	51.7	13.7
3	30.15	29.96	30.064	72.5	5 P	36.0	6 A	54.3	57.7	51.0	13.2
4	30.08	29.95	29.983	81.0	6 P	52.0	5 A	66.5	65.9	57.5	9.2
5	30.38	30.08	30.265	74.0	2 P	49.0	5 A	61.5	62.4	55.7	13.1
6	30.40	30.25	30.327	77.5	4 P	40.0	5 A	58 7	60.3	53.7	13.4
7	20.28	30.08	30.161	83.0	3:30 P	45.0	5 A	64.0	65.4	58.7	12.9
8	30.09	29.90	29.978	87.0	4 P	53.0	5 A	70.0	72.1	66.5	13.3
9	29.93	29.75	29.834	85.0	4:30 P	59.5	4:30 A	72.3	71.9	63.0	12.9
10	29.86	29.75	29.816	81.0	3 P	59.0	4 A	70.0	69.5	61.0	13.2
11	29.99	29.86	29.950	75.0	1 P	51.0	5:30 A	63.0	65.1	60.3	11.5
12	30.16	29 99	30.117	79.0	4 P	55.0	5 A	67.0	65.5	57.7	10.9
13	30.20	30 08	30.147	85.0	4 P	48.5	4:30 A	66.7	68.2	61.5	13.4
14	30.12	29.90	29.988	85.0	3 P	55.0	3 A	70.0	70.9	63.0	12.6
15	29.95	29.82	29.875	78.0	1 P	59.0	12 A	68.5	67.3	63.0	4.3
16	30.14	29.81	29.905	71.0	5 P	50.0	5 A	60.5	61.9	55.5	11.0
17	30.32	30.14	30.274	74.5	2:30 P	41.0	5 A	57.7	60.5	54.0	12.9
18	30.33	30.17	30.249	76 5	3 P	46.5	5 A	61.3	63.2	56 5	13.4
19	30.18	29.88	30.013	85.0	4 P	51.0	5 A	68.0	69.2	63.0	12.9
20	29.91	29.81	29.831	87.0	3 P	64 0	4 A	75.5	76.5	68.0	13.5
21	29 90	29.80	29.846	88.0	3 P	64.0	5 A	76 0	75.9	65.3	15.0
22	30 03	29 90	29.974	88.5	4:30 P	57.5	5 A	73.0	73.0	64.3	15.0
23	30.12	30 03	30 087	78.0	10:30 A	57.0	5 A	67.5	68 6	63 0	9.7
24	30.08	29.80	29.976	91.5	2:30 P	66.0	5:30 A	78.7	69.8	67.7	5.5
25	30.07	29 89	29 973	82.0	2:30 P	61.0	5 A	71.5	70.6	61.7	11.8
26	30.20	30.07	30.179	81.5	4:30 P	52.0	4:30 A	66.7	68.0	59.0	13.0
27	30.19	30.05	30.121	87.5	4 P	51.0	4:30 A	69.3	71.1	63.5	13.7
28	30.14	30.07	30.108	86.0	4 P	55.0	5 A	70.5	72.4	64.3	12.5
29	30.07	29 98	30.012	81.0	12 M	64.0	4:30 A	72.5	71.5	67.7	9.7
30	30.10	29.93	30.005	84.0	12 M	60.0	12 P	72.0	73.4	66.5	12.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	51.0	.572	66.5	W.N.W.	149	5.0	32	2 P	10 A	12 M	T	
2	42.5	.514	57.5	N.W.	177	7.0	37	1 P				
3	45.0	.491	61.5	W.S.W.	120	3.0	24	3 P				
4	52.5	.617	63.5	E.S.E.	145	1.0	14	4 P				
5	51.0	.542	70.5	E.S.E.	150	1.0	14	8 P				
6	48.5	.526	66.0	S.S.E.	184	1.0	14	8 P				
7	54.5	.635	66.5	S.	151	2.0	20	4 P				
8	63 0	.790	74.0	S.S.W.	148	1.5	17	1 P				
9	59.0	.729	68.5	S.	252	5.0	32	1 P				
10	56.0	.686	66.0	W.	160	2.5	22	10 P				
11	56.0	.645	68.0	N.W.	76	0.0	—	—				
12	53 0	.599	67.0	W.S.W.	85	2.0	20	10 P				
13	56 5	.697	67.0	S.W.	50	1.0	14	0 A				
14	58.0	.753	65.0	S.	172	4.5	30	10 A				
15	61.0	.641	85.0	S.S.E.	295	4.0	28	7 P	2 P	12 P	.28	
16	52.0	.527	73.5	N.W.	197	4.5	30	12 M	0 A	7:30 A	.13	
17	48.0	.533	64.5	N.N.W.	117	1.5	17	11 A				
18	52.0	.563	70.0	S.	168	4.0	28	5 P				
19	60.0	.692	75.5	S.S E.	204	3.0	24	4 P				
20	63 5	.930	63.0	W.S.W.	242	4.5	30	2 P				
21	59.5	.878	58.5	S.W.	257	4.5	30	12 M				
22	60.0	.775	66.5	N.N.E.	70	0.0	—	—				
23	59.5	.669	78.0	S.W.	69	0.0	—	—				
24	66 5	.722	91.5	S.	205	5.0	32	4 P	3 P	9 P	.28	
25	57.0	.680	69.0	W.N.W.	178	2.5	22	12 M				
26	53.0	.678	59.0	N.E.	106	4.5	30	9 A				
27	59.5	.748	77.0	S.S.W.	67	1.0	14	4 P				
28	60.0	.751	70.5	S.	72	0.5	10	6 P				
29	65.0	.797	78.5	S.	134	4.0	28	2 P	1 P	2 P	.07	
30	63 5	.766	77.0	W.	171	3.0	24	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

Clear, warm, dry weather characterized the month of June. The large amount of sunshine and the almost total absence of rain were especially noticeable. Although the month was considerably warmer than usual the maximum temperature was above 90 degrees on but a single date.

Comparing the records with those of previous years the following features were noted : The mean barometer was considerably above the normal and the change of pressure small, giving a range less than usual. The maximum and minimum records were both high.

The maximum temperature was about normal and the minimum low, giving a range larger than usual. The mean temperature was about two degrees above the average for June.

The mean dew-point and relative humidity were both low. The low humidity made the days of high temperature less oppressive than usual.

The precipitation record was the smallest since the station was established, being in fact about one-fifth of the normal. The former low record for June was that for 1901, the amount being .87 in.

The amount of bright sunshine was nearly 50 hours greater than the next highest record and about 125 hours more than the normal. Only two days were recorded as cloudy and each of those had over four hours of sunshine. More than three-fourths of the days were clear.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 235. JULY, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.97, 25th, 0 A.
Minimum reduced to freezing,	29.32, 18th, 12 M.
Reduced† maximum reading,	30.26, 25th, 0 A.
Reduced† minimum reading,	29.60, 18th, 12 M.
Mean semi-daily reduced,	30.039
Monthly range,	0.66

****Air Temperature.*** In Degrees Fahr.

Highest,	96.0, 12th, 1:30 P.
Lowest,	46.0, 9th, 5 A; 17th, 5 A.
Mean hourly,	72.5
Mean of means of max. and min.,	72.8
Mean sensible (wet bulb),	66.2
Monthly range,	50.0
Highest mean daily,	80.0, 7th
Lowest mean daily,	64.3, 16th
Mean maximum,	85.2
Mean minimum,	60.4
Mean daily range,	24.8
Greatest daily range,	40.0, 9th
Least daily range,	9.0, 25th

Humidity.

Mean dew point,	3.1
Mean force of vapor,	.776
Mean relative humidity,	76.6

Precipitation. In inches.

Total precipitation,	3.28
Number of days on which .01 inch or more rain or melted snow fell,	12

Wind.

Total movement,	3815m.
Greatest daily movement,	283m., 18th.
Least daily movement,	50m., 3d.
Mean daily movement,	123 m.
Mean hourly velocity,	5.1 m.

Maximum pressure per square foot, 10.0 lbs.= 45 m. per hour, 18th, 12 M., S.S.W.

Maximum velocity for 5 minutes, 48 m. per hour 18th, 12 M., S.S.W.

Prevailing Direction, South Southwest.

Summary.

West	13 per cent
West Southwest	13 " "
South Southeast,	16 " "
South,	23 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	47 per cent.
Total cloudiness recorded by the Sun Thermometer,†	154 hrs.=33 per cent.
Number of clear days,	10
Number of fair days,	19
Number of cloudy days,	2

Bright Sunshine.

Number of hours recorded, 308 hrs.=67%

Rain, 2d, 3d, 4th, 6th, 12th, 14th, 15th, 17th, 18th, 22d, 23d, 24th, 25th, 29th.

Thunder and Lightning—2d, 3d, 4th, 12th, 14th, 15th, 17th, 18th, 23d, 30th, 31st.

Gales, 35 miles or more per hour: 35 m., 8th, W.N.W.; 45m., 18th, S.S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							Number of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.22	30.10	30.183	85.0	5 P	53.5	5 A	69.3	70.6	64.5	12.2
2	30.25	30.15	30.234	84.0	12 M	64.0	12 P	74.0	70.7	67.3	3.7
3	30.21	30.11	30.191	80.0	4 P	61.0	3:30 A	70.5	70.7	68.3	8.3
4	30.19	30.06	30.145	83.5	0:30 P	68.5	2 A	76.0	75.6	71.3	6.2
5	30.10	30.02	30.078	90.0	2:30 P	72.0	5 A	81.0	79 4	73.3	11.0
6	30.17	30.06	30.124	91.5	3 P	65 0	4:30 A	78.3	79.5	71.3	13.4
7	30.06	29.83	29 963	94.0	2:30 P	65.0	5:30 A	79.5	80.0	74.3	9.7
8	30.04	29.79	29.921	73 0	12 M	53 0	12 P	63.0	68.5	59.3	11.1
9	30.18	30.03	30.130	86.0	5 P	46.0	5 A	66.0	66.8	59.5	13.8
10	30.13	29.99	30.073	83.5	4 P	52.0	5 A	67.7	68.9	63.0	13.0
11	30.04	29.86	29.963	89.0	4 P	57.0	5 A	73.0	72.9	65.5	11.3
12	29.90	29 79	29.861	96.0	1:30 P	67.0	5 A	81.5	76.4	68.0	8.2
13	29.90	29 82	29.880	89.0	4 P	61.5	5 A	75.3	76.2	67.3	13.0
14	29.83	29.72	29.790	86.0	1 P	59.0	12 P	72.5	71.7	64.0	6.0
15	29.92	29.72	29.849	77.0	12 M	53.0	4:30 A	65.0	64.6	58.0	8.7
16	30.06	29.92	30.017	78.0	5 P	49.0	5 A	63.5	64.3	56.3	13.7
17	30.08	29.67	29.942	78.5	12 M	46.0	5 A	62.3	65.0	60.0	7.7
18	29.72	29 60	29.648	91.0	0:30 P	66.0	2 A	78.5	74.1	70 7	9.4
19	29.90	29.66	29.811	87.0	3 P	68.0	5 A	77.5	76.5	67.3	11.3
20	30.18	29.90	30.096	87.0	5 P	59.5	5 A	73.3	73.4	68.3	13.4
21	30.23	30.08	30.186	80.0	3:30 P	65.0	12 P	72.5	70.2	64.5	7.4
22	30 08	30 00	30.052	88.0	5:30 P	61 0	7 A	74.5	73.8	66.3	9.7
23	30.15	30.06	30 132	93.0	3 P	68 0	5 A	80.5	78.9	72.5	10.0
24	30.26	30.15	30.231	84.5	2:30 P	68.0	5 A	76.3	74.7	68.0	9.0
25	30.26	30.17	30 236	71.0	0 A	62.0	12 P	66.5	64.7	62.7	0.0
26	30.24	30.10	30.184	83.0	4 P	56.5	3:30 A	69.7	70.0	65.5	11.7
27	30.13	29.95	30.026	90.0	3:30 P	56.0	6 A	73.0	73.3	64.0	10.7
28	30.15	29.95	30.104	82.5	11 A	63.0	5:30 A	72.7	72.7	66.7	12.0
29	30.21	30.12	30.162	84.0	3:30 P	63.0	5 A	73.5	71.7	67.0	8.7
30	30.15	30.02	30.078	87.5	2 P	60.0	5 A	73.7	74.1	68.0	11.8
31	30 05	29.83	29.913	89.0	3 P	64.5	5 A	76.7	77.3	70.3	11.8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure per Sq Foot.	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	61.5	.716	78.5	S.W.	59	0.5	10	6 P				
2	66.0	.691	93.0	S.S.E.	122	1.5	17	3 P	1:30 P	8 P	.43	
3	67.0	.737	91.5	S.S.E.	50	0.0	—	—	1:30 P	2:30 P	.08	
4	70.0	.840	88.0	S.	125	1.5	17	8 P	11 P	12 P	.01	
5	71.5	.943	82.0	S.	190	1.5	17	3 P				
6	67.5	.957	72.0	W.S.W.	88	1.0	14	4 P	11 P	12 P	.01	
7	71.5	1.023	76.5	S.	99	3.0	24	4 P				
8	53.5	.670	63.5	W.	249	6.0	35	2 P				
9	54.5	.656	65.5	S.S.W.	73	0.0	—	—				
10	60.0	.693	76.5	S.	97	1.0	14	10 P				
11	62.5	.773	74.5	S.	200	2.5	22	4 P				
12	64 5	.830	75.5	W.	148	2.0	20	4 P	3:30 P	4:30 P	.01	
13	60.0	.899	59.0	W.S.W.	133	2.0	20	1 P				
14	61.0	.718	75.0	S.W.	109	1.0	14	4 P	4 P	6 P	.42	
15	53.5	.601	69.0	W.N.W.	120	2.0	20	2 P	2:30 P	3 P	.04	
16	49.0	.619	57.0	W.	186	3 5	26	12 M				
17	56.5	.619	74.5	S.E.	147	3.0	24	12 P	1 P	12 P	.12	
18	68.5	.870	80.5	S.	283	10.0	45	12 M	12 M	12 P	.85	
19	63.5	.853	69.0	W.S.W.	93	0.5	10	4 P				
20	65.5	.835	75.5	N.N.W.	100	0.5	10	10 A				
21	62.0	.696	81.0	S.	146	1.5	17	6 P				
22	62.5	.756	83.5	W.S.W.	61	0.0	—	—	4 A	8 A	.08	
23	71.0	.883	87.0	E.	59	0.0	—	—	1 A	4 A	.01	
24	65.0	.824	75.5	N.	116	0.5	10	8 A	3 P		T	
25	62.0	.596	92.0	N.N.W.	90	0.0	—	—	3 A	5 P	1.22	
26	62.5	.750	76.5	W.	62	0.0	—	—				
27	61.0	.731	76.5	S.E.	64	1.0	14	11 A				
28	64.0	.819	74.0	E.	90	0.0	—	—				
29	64.5	.768	80.5	S.S.E.	116	0.5	10	5 P	10 P		T	
30	65 5	.813	77.5	S.S.E.	164	0.5	10	2 P				
31	67.5	894	75.5	S.S.E.	176	1.5	17	4 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The warm weather which prevailed during June was followed by even warmer weather during July. The mean temperature for the two months was practically the same as in 1901, and slightly lower than in 1894, The relative humidity for July in each of those years was lower than the record for the month just closed.

The drought of June continued until nearly the middle of July before it was broken by rain in any amount.

The mean barometer made a new high record for July at this station. The maximam and minimum records were practically normal.

The mean temperature was more than two and one-half degrees above the normal, while the maximum and minimum records were both high. A drop in the temperature of fourteen degrees in about twenty minutes during a sudden gust of wind, about noon of the 18th, was a very unusual feature here.

The mean dew point was slightly higher than usual, and the mean relative humidity, three per cent above the normal.

The precipitation was about two thirds of the normal, the heaviest rainstorm occurring near the close of the month.

The total wind movement was about ten per cent more than the normal, winds from the south predominating.

While the amount of sunshine was considerably less than for June, the amount was large, the records showing but two days classed as cloudy.

The month closed with hot weather and high humidity.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 236. AUGUST, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 05, 31st, 9 A.
Minimum reduced to freezing,	29.38, 19th, 5 P.
Reduced† maximum reading,	30.34, 31st, 9 A.
Reduced† minimum reading,	29.66, 19th, 5 P.
Mean semi-daily reduced,	30.030
Monthly range,	0.68

****Air Temperature.*** In Degrees Fahr.

Highest,	88.5, 14th, 3 P.
Lowest,	37.0, 29th, 6 A.
Mean hourly,	66.6
Mean of means of max. and min.,	67.0
Mean sensible (wet bulb),	61.0
Monthly range,	51.5
Highest mean daily,	77.2, 13th
Lowest mean daily,	55.7, 29th
Mean maximum,	78.5
Mean minimum,	55.5
Mean daily range,	23.0
Greatest daily range,	38.5, 30th
Least daily range,	6.0, 17th, 26th

Humidity.

Mean dew point,	58.3
Mean force of vapor,	.635
Mean relative humidity,	79.0

Precipitation. In inches.

Total precipitation,	4.27
Number of days on which .01 inch or more rain or melted snow fell,	8

Wind.

Total movement,	3802m.
Greatest daily movement,	268m., 13th.
Least daily movement,	44m., 3d.
Mean daily movement,	123 m.
Mean hourly velocity,	5.1 m.
Maximum pressure per square foot,	4.0 lbs.= 28m. per hour, 27th, 11 A., N.N.E.
Maximum velocity for 5 minutes,	22m. per hour 13th, 2 P., S.
Prevailing Direction,	West.

Summary.

West	16 per cent
Northwest	22 " "
West Northwest	13 " "
Southwest	13 " "
South Southwest,	13 " "
Other directions,	23 " "

Weather.

Mean cloudiness observed,	45 per cent
Total cloudiness recorded by the Sun Thermometer,	161 hrs.=38 per cent.
Number of clear days,	13
Number of fair days,	12
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 268 hrs.=62%

Rain, 4th, 5th, 6th, 7th, 10th, 13th, 17th, 22d, 26th.

Thunder and Lightning — 4th, 5th, 6th, 7th, 10th, 12th, 13th, 17th.

Gales, 35 miles or more per hour; None.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.89	29.79	29.844	78.0	4 P	64.0	12 P	71.0	70.9	60.0	8.8
2	29.97	29.79	29.899	83.0	2 P	57.0	12 P	70 0	69.7	60.5	11.8
3	30.10	29.97	30.066	82.0	1 P	50.5	5 A	66 3	68.7	63.3	11.3
4	30.06	29.91	29.994	86.0	3:30 P	63.0	5 A	74.5	72.6	65.0	7.5
5	29 92	29.78	29.855	79.0	1 P	67.0	1 A	73.0	71.8	67.5	1.5
6	29 87	29.80	29.866	79.5	0:30 P	66 0	7 P	72 7	69.5	67.0	3.8
7	29.87	29.77	29.824	74 0	5 P	63.5	12 P	68.7	67.9	65.0	1.7
8	29.81	29.75	29.801	82.0	3:30 P	55.0	6 A	68.5	68.8	62.0	12.7
9	29.85	29 81	29.846	79.0	4 P	57.0	5 A	68.0	67.5	63.5	10.9
10	29.93	29.85	29.898	85.0	2 P	57.5	6 A	71.3	70.9	64.3	8.7
11	30.07	29.93	30.028	82.5	1 P	62.0	12 P	72.3	67.6	64 3	5 9
12	30.11	30.02	30 073	83.0	3:30 P	59.0	1:30 A	71.0	70 8	67.7	8.3
13	30.05	29.88	30.003	88.0	4 P	71.5	12 P	79.7	77.2	72.3	9 0
14	30.03	29.98	30.008	88.5	3 P	68.0	6 A	78.3	76 3	71.5	11 0
15	30.21	30.03	30.123	82.0	1 P	59 0	12 P	70.5	71.6	64.5	12.1
16	30.29	30.23	30.253	82.0	4 P	52.0	5:30 A	67.0	67.2	60 0	8.7
17	30.23	29.84	30.038	68.0	6 P	62.0	5 A	65 0	64 6	62.7	0.0
18	29.92	29 80	29.853	78.0	4:30 P	57.0	12 P	67.5	69.6	60 5	12.3
19	29.92	29 66	29.763	78.5	3 P	49.0	6 A	63 7	65 5	61.3	9 5
20	30.04	29 75	29.924	73.0	3 P	50.0	12 P	61.5	61.3	53 5	12 7
21	30 14	30.04	30.100	77 5	4:30 P	45.5	6 A	61.5	62.7	59.3	12.1
22	30.07	29.86	29.937	73 0	4 P	58.0	2 A	65 5	66 2	64.0	1.0
23	30.06	29.86	30.026	80.0	3:30 P	55.0	12 P	67.5	66.6	59.0	11.2
24	30.17	30.06	30.117	74.0	1:30 P	47.0	5:30 A	60.5	60.5	55 0	11.1
25	30.28	30.17	30.273	76.0	2 P	44.0	6 A	60 0	61.2	55.0	10.5
26	30.26	30.21	30.252	60 0	0 A	54.0	9 A	57.0	56.2	54.5	0 0
27	30.28	30.21	30.259	69.0	3 P	48 0	12 P	58 5	58.3	51.7	10 0
28	30.29	30.16	30.249	71.5	3:30 P	41.0	5:30 A	56 3	56.2	52.0	11.5
29	30.25	30.15	30.230	75.0	4 P	37.0	6 A	56.0	55.7	49 7	12.0
30	30.25	30.18	30.229	82.5	4 P	44 0	6 A	63.3	63.2	54 5	9 4
31	30.34	30 25	30.306	84 0	3:30 P	57.0	6 A	70.5	69 1	62.5	11.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	55 5	.654	67.5	N.N.W.	220	3.0	24	7 A				
2	56.0	.689	65.5	N.W.	148	1.5	17	6 P				
3	59 5	.731	69.5	W.	44	0.0	—	—				
4	62.0	.744	76 0	S.	167	1.0	14	7 P	9 A	12 P	T	
5	66.0	.750	84 5	S.	161	2.0	20	5 P	0 A	9 P	.47	
6	66.0	.710	90 5	S.S.E.	103	0.0	—	—	11 A	8 P	.48	
7	63.0	.670	88 0	E.	61	0 0	—	—	10 A	12 P	.11	
8	58 0	.685	70.5	W.S.W.	70	0 5	10	5 P				
9	61 5	.642	86 5	S S.W.	45	0 0	—	—				
10	61.0	.703	78.5	W.	49	0 0	—	—	6 A	5 P	.79	
11	63.5	.637	91.0	E.S.E.	122	3 5	26	4 P				
12	66 5	.746	89 5	S.S.E.	88	2 5	22	7 P				
13	71.5	.841	91.5	S.	268	3.5	26	2 P	7 P	9 P	.22	
14	69.0	.893	81.0	W.S.W.	101	1.5	17	10 A				
15	61.0	.760	71 0	N.N.W.	128	4.0	28	4 P				
16	56.0	.635	71 5	S.W.	88	1.5	17	9 P				
17	61.5	.592	95.0	S.	254	4 0	28	11 A	3 A	9 P	1.02	
18	55.5	.678	65 0	W.N.W.	187	2 0	20	3 P				
19	57.5	.659	73.5	W.S.W.	128	1 5	17	2 P				
20	49.0	.509	69 0	N.W.	150	1 0	14	2 P				
21	56 0	.608	73 5	S.W	137	1 5	17	1 P				
22	62 5	.649	88 0	S.S.E.	217	3.5	26	5 A	5 A	3 P	.39	
23	55 5	.597	74 5	W.N.W.	97	0.5	10	3 P				
24	52.0	.499	77 5	W.	72	1.0	14	5 P				
25	51.5	.513	75 5	S.W.	53	0.5	10	4 P				
26	53.5	.437	94.0	N.N.W.	106	1.0	14	4 P	2 A	5 P	.79	
27	49.5	.430	82 0	N.N.E.	222	4.0	28	11 A				
28	49.5	.435	82 0	N.E.	121	1.5	17	2 P				
29	47 0	.412	79 0	S.S.W.	62	0.0	—	—				
30	50 5	.527	72.5	S.S.E.	62	0.0	—	—				
31	59 5	.666	75 5	N.W.	71	0 5	10	8 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during August was generally seasonable, abnormal features being scarcely noticed. The high temperature of the preceding two months was not continued into this, and near the close of the month several days of comparatively low temperature were noted.

The records show the following facts of more or less interest. The mean barometer was high for August, while the range and maximum and minimum records were practically normal. The fluctuations were small and generally slow, as would be expected from the daily wind movement record.

The mean temperature was two degrees lower than normal, and both the maximum and minimum records were low. In fact, the minimum record equaled the previous low August record of 37.0 degrees for 1894. Although no frost was noted at the station on the date of the low temperature, light frost was reported from a number of places in this vicinity.

The precipitation was slightly less than the usual amount and fairly well distributed throughout the month. A heavy thunder storm on the 10th was accompanied by a trace of hail at the station. In some of the adjoining towns much damage was done to the tobacco by the hail.

The mean dew point was rather low, and the relative humidity considerably higher than usual.

The total wind movement was about one-fourth more than usual, but no gales were recorded. Much of the wind was from the northwest quadrant. The sunshine record was well above the normal.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 237. SEPTEMBER, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.15, 15th, 9 A.
Minimum reduced to freezing,	29.43, 2d, 4 P.
Reduced† maximum reading,	30.45, 15th, 9 A.
Reduced† minimum reading,	29.72, 2d, 4 P.
Mean semi-daily reduced,	30.100
Monthly range,	0.73

****Air Temperature.*** In Degrees Fahr.

Highest,	88.0, 11th, 3 P.
Lowest,	33.0, 30th, 6:30 A.
Mean hourly,	62.9
Mean of means of max. and min.,	64.0
Mean sensible (wet bulb),	56.6
Monthly range,	55.0
Highest mean daily,	71.3, 11th
Lowest mean daily,	48.8, 30th
Mean maximum,	77.5
Mean minimum,	50.5
Mean daily range,	27.0
Greatest daily range,	41.0, 9th
Least daily range,	6.0, 6th.

Humidity.

Mean dew point,	53.5
Mean force of vapor,	.539
Mean relative humidity,	79.1

Precipitation. In inches.

Total precipitation,	1.73
Number of days on which .01 inch or more rain or melted snow fell,	4

Wind.

Total movement,	3757m.
Greatest daily movement,	269m., 29th.
Least daily movement,	27m., 23d.
Mean daily movement,	125 m.
Mean hourly velocity,	5.2 m.

Maximum pressure per square foot, 9.0 lbs.= 42m. per hour, 29th, 0A., S.S.E.

Maximum velocity for 5 minutes, 27m. per hour 29th, 0A., S.S.E.

Prevailing Direction, Southwest.

Summary.

South	20 per cent
North Northwest	10 " "
West Northwest	10 " "
West Southwest	10 " "
South Southeast,	17 " "
Other directions,	33 " "

Weather.

Mean cloudiness observed,	27 per cent.
Total cloudiness recorded by the Sun Thermometer,	131 hrs.=35 per cent.
Number of clear days,	7
Number of fair days,	19
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 242 hrs.=65%

Rain, 2d, 6th, 28th, 29th.

Thunder and Lightning— 28th, 29th.

Frost, 16th, 30th.

Gales, 35 miles or more per honr; 35m., 14th, N.N.W.; 41m. 28th, S.S.E.; 42m. 29th, S.S.E.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum	Time.	Minimun.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.27	29.96	30.104	84.0	3 P	56.0	6 A	70.0	67.0	62.3	7.8
2	29.96	29.72	29.807	76.0	5 P	63.0	12 P	69 5	67.7	64.3	6.2
3	30.16	29.80	30.030	70.0	2:30 P	49.0	12 P	59 5	59.9	52.3	9.7
4	30.23	30.10	30.195	77.0	3 P	40.0	6 A	58.5	58.6	53.5	11.7
5	30.15	30.00	30 091	78.0	2 P	52.0	5:30 A	65.0	64.0	58.5	9.4
6	30 00	29 78	29.857	66.0	9 A	60 0	5 A	63 0	62.1	60 0	0.0
7	30.15	29.79	30 034	76 0	2.P	49 0	12 P	62.5	62.0	55.0	11.3
8	30.31	30.15	30.291	74.5	3:30 P	39 5	6 A	57.0	57.3	52.5	11.5
9	30.36	30.19	30.289	82.0	3 P	41.0	6 A	61.5	62.9	55.7	8.5
10	30.24	30.11	30.186	83 5	3 P	52.0	6 A	67.7	68.1	60.3	8.2
11	30.11	30.01	30.067	88.0	3 P	59.5	6 A	73 7	71.3	63 0	8.3
12	30 11	30.05	30 074	78.0	3 P	59 5	5 A	68.7	67.2	59 7	8 4
13	30.05	29.90	29.960	82 0	5 P	53.0	6 A	67.5	64.9	57 0	8.8
14	30.32	29.94	30.133	74.0	3 P	51.0	6 A	62.5	61.3	54.0	10 3
15	30 45	30.32	30 376	71.0	4 P	40 0	5 A	55.5	54.9	51.7	11.0
16	30.36	29 94	30.164	74.0	3 P	36 0	6 A	55.0	56.2	49 7	5.6
17	29 94	29.77	29.851	84.0	2 P	57.0	6 A	70.5	67.9	54 3	7.6
18	29 90	29.76	29.851	82 0	3:30 P	47.0	6 A	64.5	64.4	53 3	9.2
19	30.25	29 80	30.028	76.0	4:30 P	47 0	12 P	61.5	63.8	53 0	9.2
20	30.36	30 25	30.327	73.0	3:30 P	39 0	6 A	56.0	55.1	47.3	10 4
21	30.30	30 09	30.173	75 5	2 P	46.0	6:30 A	60.7	60.4	56.0	8.7
22	30.14	30.03	30.099	77 0	4 P	51 0	6 A	64 0	62.8	58.5	6.7
23	30.07	30.00	30.058	77 0	4 P	54 0	3 A	65 5	63 0	5).0	5 7
24	30.16	30.03	30.085	77 0	4 P	57.0	5:30 A	67.0	65.0	61 3	3 7
25	30.25	30.16	30.243	83.0	3 P	60.0	5:30 A	71.5	68.7	63 3	7.9
26	30.24	30.14	30.213	81.0	3 P	61.5	5 A	71.3	67.6	64 3	5 6
27	30.19	30.11	30.171	84.0	3 P	57.0	7 A	70.5	69.2	62 5	9.5
28	30.17	29 80	30.011	80.0	2 P	60.0	2 A	70 0	69.5	66.7	2.4
29	30.18	29.76	30.030	76.0	2 P	44.0	12 P	60.0	56.9	49 5	8.8
30	30.29	30.13	30.218	68.0	3 P	33.0	6:30 A	50.5	48.8	40.7	10.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	60.5	.622	86.0	S.	170	2.5	22	5 P				
2	62.0	.663	85.0	W.N.W.	137	2.0	20	2 A	2:30 P	12 P	.30	
3	48.5	.463	74.0	W.N.W.	187	3.0	24	2 P				
4	51.0	.466	82.5	S.S.E.	87	1.5	17	5 P				
5	56.5	.548	84.0	S.	206	3.5	26	4 P				
6	57.5	.576	84.5	S.S.E.	151	2.0	20	10 A	9 A	7 P	.09	
7	51.5	.520	73.5	N.W.	139	3.0	24	2 P				
8	50.5	.434	83.5	W.	59	2.0	20	4 P				
9	53.0	.535	80.0	S.S.W.	104	1.5	17	3 P				
10	57.5	.599	81.0	S.E.	100	0.5	10	4 P				
11	60.5	.660	81.5	N.E.	98	0.0	—	—				
12	56.5	.618	73.5	W.N.W.	76	0.0	—	—				
13	53.5	.563	75.0	S.S.W.	35	0.0	—	—				
14	49.0	.516	69.0	N.N.W.	200	6.0	35	12 M				
15	48.0	.449	76.5	N E.	134	1.5	17	3 P				
16	46.0	.421	77.0	N.N.W.	126	4.0	28	2 P				
17	44.5	.624	48.5	N.N.W.	218	4.0	28	11 A				
18	46.0	.556	61.0	W.S.W.	68	0.0	—	—				
19	47.5	.494	69.0	N.	150	4.0	28	11 A				
20	42.5	.397	69.0	S.	95	0.5	10	10 P				
21	54.5	.495	86.0	S.	187	3.0	24	3 P				
22	57.5	.517	93.0	S.S.E.	56	0.0	—	—				
23	57.5	.546	88.5	S.S. E.	27	0.0	—	—				
24	60.0	.573	92.0	E.N.E.	58	0.0	—	—				
25	61.5	.640	85.0	S.S.W.	102	0.5	10	1 A				
26	64.0	.632	93.5	S.	79	0.5	10	5 P				
27	60.5	.626	86.0	S.	164	2.0	20	7 P				
28	65.5	.717	88.0	S.S.E.	214	8.5	41	11 P	8 A	12 P	.11	
29	45.5	.408	75.5	N.W.	269	9.0	42	0 A	0 A	5 A	1.23	
30	36.0	.294	72.0	W.S.W.	61	0.5	10	5 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The most marked characteristic of the weather during September was the drought which prevailed during practically the whole month. From the 6th to the 28th, not a trace of rain was noted, and prior to that but two very small amounts were recorded. From the 1st of June until the end of September, the precipitation at this station was about four-sevenths of the normal. The accumulated deficiency for the four months was about seven and one-half inches. A large amount of hazy weather, probably due to forest fires, was also noted.

Comparing the records with those of previous years, the following are the more important features: The mean barometer was rather high and the range slightly less than usual. The fluctuations were generally small. More than the usual amount of wind was from the south points of the compass.

The mean temperature was about one and one-half degrees above the normal, while the maximum and minimum records were both close to the usual figures.

The mean dew point was slightly lower than the normal, while the relative humidity was higher than usual.

The total precipitation was about 40 per cent of the normal, and over three fourths of it occurred during a single shower near the close of the month.

The total wind movement was more than the September mean.

The number of cloudy days was very small, and the amount of sunshine considerably more than usual. An unusually fine display of "Northern lights" was noted on the evening of the 29th.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 238. OCTOBER, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.28, 22d, 9 A.
Minimum reduced to freezing, 29.12, 30th, 5 A.
Reduced† maximum reading, 30.59, 13th, 7 A.; 22d, 9 A.
Reduced† minimum reading, 29.42, 30th, 5 A.
Mean semi-daily reduced, ... 30.170
Monthly range, ... 1.17

****Air Temperature.*** In Degrees Fahr.

Highest, ... 90.5, 17th, 3 P.
Lowest, ... 23.0, 13th, 6 A.; 21st, 6:30 A.
Mean hourly, ... 51.3
Mean of means of max. and min., ... 52.3
Mean sensible (wet bulb), ... 45.3
Monthly range, ... 67.5
Highest mean daily, ... 64.3, 25th
Lowest mean daily, ... 36.9, 31st
Mean maximum, ... 66.2
Mean minimum, ... 38.5
Mean daily range, ... 27.7
Greatest daily range. 49.0, 17th
Least daily range, ... 5.0, 26th

Humidity.

Mean dew point, ... 41.8
Mean force of vapor, ...351
Mean relative humidity, ... 79.0

Precipitation. In inches.

Total precipitation, ... 1.57
Number of days on which .01 inch or more rain or melted snow fell, ... 6

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3643m.
Greatest daily movement, ... 458m., 30th.
Least daily movement, ... 10m., 16th.
Mean daily movement, ... 118 m.
Mean hourly velocity, ... 4.9 m.
Maximum pressure per square foot, 9.0 lbs.= 42m. per hour, 12th, 1A., N.N.W.; 31st, 11A, W. N. W.
Maximum velocity for 5 minutes, 36m. per hour 30th, 2P., N.N.W.
Prevailing Direction, Southwest.

Summary.

South Southeast	26 per cent
North Northwest	19 " "
West Northwest	13 " "
East Northeast	10 " "
Other directions, ...	32 " "

Weather.

Mean cloudiness observed, ... 37 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 155 hrs.=45 per cent.
Number of clear days, ... 11
Number of fair days, ... 9
Number of cloudy days, ... 11

Bright Sunshine.

Number of hours recorded, . . 186 hrs.=55%
Rain, 2d, 11th, 25th, 26th, 28th, 29th, 30th.
Lightning, 27th.
Frosts, 3d, 4th, 5th, 6th, 13th, 14th, 15th, 21st, 22d, 23d.
Gales, 35 miles or more per hour; 42m., 12th, N.N.W.; 39m. 30th, W.N.W.; 42m., 31st, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	29.87	30.023	57.0	4 P	38.0	4 A	47.5	48.4	47.0	0.0
2	30.18	29.81	29.998	57.0	12 M	39.0	12 P	48.0	47.8	42.5	1.7
3	30.31	30.18	30.289	68.0	4:30 P	32.5	6 A	50.3	47.5	41.5	10.5
4	30.35	30.24	30.344	68.5	2 P	33.0	6 A	50.7	49 8	43.7	9.6
5	30.39	30.24	30.343	69 5	4:30 P	33.0	6 A	51.3	47.7	40.0	10.2
6	30.35	30.27	30.338	70.5	2:30 P	33 0	6 A	51.7	50.5	44.3	10.0
7	30.29	30.11	30.222	70.0	2:30 P	41.5	6:30 A	55 7	54.7	48.0	7.2
8	30.11	30.03	30.081	72.5	3:30 P	48.0	6 A	60.3	60.1	55.0	6.6
9	30.17	29.96	30.066	70.0	2 P	50.0	12 P	60.0	57.8	53.7	3 7
10	30.35	30.04	30.281	59 5	3 P	37.5	6 A	48 5	51.0	46.7	6.2
11	30.04	29.78	29.903	69.0	4 P	51.0	3 A	60.0	57.0	53.0	2.0
12	30.54	30.04	30 431	52.0	3 P	27.0	12 P	39 5	42.2	33.5	8.5
13	30.59	30.33	30.483	64 5	3 A	23 0	6 A	43.7	42.5	34 7	11.7
14	30.33	30.06	30.189	72.5	3:30 P	28.5	6:30 A	50.5	49.0	39 3	11.3
15	30.09	29.93	30.037	79 5	3 P	32.0	6 A	55.7	53 2	42.7	8.4
16	30.13	30.02	30.112	81 0	3 P	41.0	6 A	61.0	57.0	49.5	8.7
17	30.21	30.13	30.194	90.5	3 P	41.5	6 A	66.0	60 3	50.0	9.3
18	30.23	30.06	30.158	82 0	3 P	41.0	7 A	61.5	58 4	48.7	7.6
19	30.27	30.02	30.129	65.0	1 P	45.0	12 P	55.0	53 5	45 5	0.2
20	30.48	30.27	30.469	52.5	3:30 P	29.0	12 P	40.7	41.6	35.5	9.4
21	30.56	30.45	30.528	59.5	4 P	23.0	6:30 A	41.3	39 3	34.3	9.2
22	30.59	30.46	30.539	68.0	3:30 P	25 0	6:30 A	46.5	44 7	37 3	9.1
23	30.50	30.32	30.418	71.0	3 P	28.5	6 A	49.7	49 0	42 3	8.7
24	30.32	30.15	30.221	68 5	4:30 P	46.0	2 A	57.3	59.1	54.7	1.1
25	30.16	30.08	30.121	69.0	3 P	59.0	3:30 A	64.0	64 3	58.5	0 6
26	30.12	29 92	30.036	60.0	3 P	55.0	5 A	57.5	57.3	55.5	0.0
27	30.03	29.92	29.965	68.0	3 P	52.0	12 P	60.0	58.3	53.7	5.5
28	30.03	29 81	29.958	55.0	3 P	49.0	8 A	52.0	51.5	49 7	0 0
29	29 85	29.57	29.769	59 0	12 M	50.0	2 A	54.5	52.8	51.0	0.6
30	29 81	29 42	29.643	57.5	12 M	33.0	12 P	45.3	47.7	41.3	3.5
31	30.08	29.81	29.984	45.0	12 M	28.5	6 A	36 7	36.9	31.7	4.8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	41.5	.339	91.0	S.S.E.	20	0.0	—	—				
2	39.0	.305	78.0	W.S.W.	193	4.0	28	2 P	2 A	6 A	.17	
3	35.5	.307	69.5	W.N.W.	86	0.0	—	—				
4	49.5	.330	74.5	N.N.W.	74	2.0	20	3 P				
5	36.5	.269	82.5	N.N.W.	86	0.0	—	—				
6	40.5	.331	80.0	S.W.	55	0.5	10	2 P				
7	45.5	.374	82.0	S.	114	0.5	10	4 P				
8	53.5	.460	91.5	S.S.W.	141	0.5	10	2 P				
9	51.5	.455	86.0	N.N.W.	91	0.5	10	8 P				
10	44.5	.351	86.5	E.N.E.	104	0.5	10	12 M				
11	50.5	.448	84.5	W.	97	3.0	28	11 P	0 A	7 P	.34	
12	28.0	.221	72.0	N.N.W.	281	9.0	42	1 A				
13	28.5	.243	67.0	S.S.E.	83	1.0	14	4 A				
14	34.0	.293	71.5	S.S.E.	81	0.5	10	4 P				
15	37.0	.345	66.5	S.S.E.	24	0.0	—	—				
16	47.5	.307	86.0	S.S.E.	10	0.0	—	—				
17	46.0	.425	75.5	S.S.E.	23	0.0	—	—				
18	44.5	.433	70.5	W.	21	0.0	—	—				
19	40.5	.355	74.0	N.N.W.	179	6.0	34	2 P				
20	27.5	.248	62.0	N.E.	195	1.5	17	7 P				
21	31.5	.214	84.5	W.N.W.	55	0 0	—	—				
22	31.5	.272	67.5	E.S.E.	43	0.5	10	1 P				
23	39.0	.310	81.5	S.S.E.	58	0.5	10	2 P				
24	52 5	.495	82.0	S.S.E.	63	1.0	14	8 P				
25	55.0	.571	77.5	E.N.E.	136	2.5	22	5 P	12 M		T	
26	54.5	.450	94.0	E.N.E.	126	1.5	17	10 P	0:30 A	11 P	.40	
27	52.5	.440	89.5	W.S.W.	110	0.5	10	0 A				
28	49.0	.365	97.0	E.	64	1.5	17	12 P	5 A	12 P	.53	
29	49.0	.393	90.0	N.N.W.	211	5.5	33	12 P	0 A	12 P	.07	
30	35.5	.312	68.0	W.N.W.	458	7.5	39	2 P	0 A	8 A	.06	
31	25.0	.206	66.0	W.N.W.	361	9 0	42	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The most pronounced feature of the weather during October was the continuation of the drought. The deficiency in precipitation from the first of June, noted in the last bulletin, was augmented during October by more than two inches, so that the last five months show an accumulated deficiency of nearly ten inches. The total deficiency so far for the year is twelve inches, or nearly one-third of the normal amount. Both the temperature and barometer records were considerably above the normal.

The records, compared with those of previous years, show the following features: While both the maximum and minimum barometer records were nearly normal, the mean pressure was more than a tenth of an inch above the normal. The maximum record was above 30 inches for the first 28 days, showing comparatively little activity for that period. The total wind movement was about ten per cent less than usual, and the amount from the southeast quadrant was unusually large.

The mean temperature was about a degree and a half above the normal and the difference between the mean of maximum and minimum and the mean hourly considerably larger than usual.

The maximum record was above 90 degrees for the first time for October since this station was established. This record was about 12 degrees higher than the average October maximum. The minimum record was practically normal, giving an unusually large range.

The mean dew point was practically normal and the relative humidity higher than usual.

The total precipitation was hardly two-fifths of the normal, and over two-thirds of it fell during the last week of the month. The October records of .66 in. in 1892 and .73 in. in 1897, are the only ones showing a smaller amount for this month.

The amount of sunshine was slightly above the average. The first heavy frost of the season occurred on the 3d.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 239. NOVEMBER, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 13, 22d, 9 A.
Minimum reduced to freezing,	29.01, 4th, 9 A.
Reduced† maximum reading,	30.45, 22d, 9 A.
Reduced† minimum reading,	29.31, 4th, 9 A.
Mean semi-daily reduced,	30.008
Monthly range,	1.14

****Air Temperature.*** In Degrees Fahr.

Highest,	58.0, 3d, 2 P.; 24th, 3 P.
Lowest,	18.5, 5th, 6 A; 19th. 7:30 A.
Mean hourly,	38.0
Mean of means of max. and min.,	38.5
Mean sensible (wet bulb),	34.3
Monthly range.	39.5
Highest mean daily,	49.2, 26th
Lowest mean daily,	28.8, 5th
Mean maximum,	47.2
Mean minimum,	29.8
Mean daily range,	17.4
Greatest daily range,	33.0, 4th
Least daily range,	4.0, 11th

Humidity.

Mean dew point,	30.1
Mean force of vapor,	.223
Mean relative humidity,	79.6

Precipitation. In inches.

Total precipitation,	1.06
Number of days on which .01 inch or more rain or melted snow fell,	8
Total snow in inches,	3.5

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5485m.
Greatest daily movement,	382m., 4th.
Least daily movement,	31m.,25th.
Mean daily movement,	183 m.
Mean hourly velocity,	7.6 m.

Maximum pressure per square foot, 9.5 lbs.= 44m. per hour, 4th, 11A., S.W.

Maximum velocity for 5 minutes, 36m. per hour 4th, 10A., S.W.

Prevailing Direction, Southwest.

Summary.

South Southeast	20 per cent
West Southwest	20 " "
West Northwest	17 " "
South,	13 " "
Other directions,	30 " "

Weather.

Mean cloudiness observed,	46 per cent.
Total cloudiness recorded by the Sun Thermometer,	182 hrs.=62 per cent.
Number of clear days,	3
Number of fair days,	13
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, 111 hrs.=38%

Rain, 5th, 8th, 11th, 14th, 15th, 18th, 19th, 25th. 26th, 30th.

Snow, 5th, 14th, 15th, 18th.

Gales, 35 miles or more per honr; 36m., 1st., W.N.W.; 44m., 4th, S.W.; 35m., 6th, W.S W.; 38m., 12th, W.; 35m., 15th, W.S. W.; 35m., 27th, W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.25	30.08	30.212	40.5	3 P	28.0	7 A	34.3	33.5	27.5	8.8
2	30.30	30.12	30.241	48.0	1 P	24 0	7 A	36.0	36.5	31.5	8.5
3	30.12	29.64	29.903	58.0	2 P	33.5	0 A	45.7	45.2	39.3	5.0
4	29.67	29.31	29 505	57.0	9:30 A	24.0	12 P	40.5	39 4	36.0	0.0
5	29.73	29.64	29.708	38 0	3 P	18.5	6 A	28.3	28.8	26.5	6.1
6	29.74	29.51	29.669	43.5	1:30 P	23.5	5:30 A	33.5	35 4	33 0	1.2
7	29.65	29.49	29.591	47.0	1130A	37.0	6 A	42.0	41.1	36 5	2.6
8	29.80	29.58	29.673	42.0	4 P	31.0	12 P	36.5	37.8	35.7	0.0
9	29.96	29.80	29 917	53.0	3 P	29 5	7 A	41.3	37.8	34.7	1.3
10	30.10	29.96	30.071	50.5	3 P	28 0	7:30 A	30.7	39 5	36.0	0.2
11	30.04	29 84	29 951	46.0	2 P	42.0	5 A	44 0	43 8	43.3	0.0
12	29.98	29.86	29.955	43.0	0 A	33 5	6 A	38 3	37.7	32.7	5.2
13	30.16	29.92	30 045	43 0	3 P	34.5	3 A	38.7	36.5	32 0	3 4
14	30.23	29.93	30.118	45.0	2 P	28.0	7 A	36.5	36.9	33 5	4.6
15	30.10	29.76	29.961	35.0	3 P	25.0	12 P	30 0	31.5	28.3	4.7
16	30.10	29.79	29 935	41.0	3 P	19.0	7 A	30.0	29 6	26.3	6.8
17	29.85	29.77	29.864	38.0	3 P	28 0	1 A	33 0	31 2	26 7	3.9
18	29.86	29.52	29 748	34 0	4 P	27 0	11 P	30.5	29 7	27 3	0.0
19	30 03	29.81	29 948	42.0	3 P	18 5	7:30 A	30.3	32 3	28.3	3 5
20	30.32	29.81	30.138	47.0	1:30 P	28.0	12 P	37.5	37.4	32.5	1.5
21	30.43	30.30	30.415	48.0	3:30 P	19.0	7 A	33.5	31.6	25.3	7.8
22	30.45	30.32	30 398	50.0	3 P	19 0	7 A	34.5	34.3	29 7	7.2
23	30.35	30.22	30.290	55.5	3 P	32.5	8:30 A	44.0	41.3	37.7	5.4
24	30.25	30.14	30.223	58.0	3 P	39.5	8 A	48.7	44.0	39.7	5.0
25	30.35	39.21	30.312	51.5	2 P	41.0	0 A	46.3	46 7	45 7	0.0
26	30.33	29.96	30.143	57.0	7:30 P	43.0	5:30 A	50.0	49.2	49.5	0 0
27	30.17	29.95	30.103	50.0	11 A	41.0	12 P	45 5	45.9	40.3	6.5
28	30.25	30 04	30.173	48 0	12 M	35.0	12 P	41.5	40.6	34.7	4 0
29	30.29	30.01	30.077	51.0	2:30 P	31.5	11 P	41.3	41.6	36.0	7.3
30	30.10	29 71	29.959	56.0	12 P	33.0	0 A	44.5	44.3	43.3	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	16.5	.180	53.5	W.N.W.	357	6.5	36	10 A				
2	25.0	.204	68.0	W.N.W.	180	4.5	30	5 P				
3	36.0	.268	78.5	W.S.W.	186	3.0	24	11 P				
4	30.0	.268	69.0	S.W.	382	9.5	44	11 A				
5	22.5	.154	82.5	W.N.W.	280	5.5	33	2 P	4 P	5 P		T
6	27.0	.209	75.0	W.S.W.	246	6.0	35	2 P				
7	31.0	.246	71.5	W.S.W.	250	4.0	28	1 P				
8	33.5	.220	89.0	S.	87	0.0	—	—	8:30 A	2 P	.02	
9	32.5	.220	87.0	S.	52	1.0	14	3 P				
10	34 0	.230	87.5	N.	34	1.0	14	5 P				
11	42.5	.286	96.0	N.N.W.	72	0.5	10	3 A	0 A	9 P	.19	
12	26.0	.214	68.5	W.	344	7.0	38	2 P				
13	25.5	.208	68.5	W.N.W.	374	5.0	32	12 M				
14	30.5	.208	81.5	S.S.E.	74	1.0	14	10 P	7:30 P	12 P	.56	2
15	24.5	.165	83.5	W.	208	6.0	35	11 P	0 A	2 A	.02	½
16	21.5	.158	75.5	S.	214	2.0	20	2 P				
17	17.0	.167	62.0	W.S.W.	230	3.0	24	2 P				
18	23.0	.160	81.5	S.S.E.	232	1.0	14	5 A	2 A	3 P	.22	1
19	25.5	.174	84.5	S.S.E.	106	1.5	17	8 P	8:30 P		T	
20	30.0	.194	88.0	N.N.W.	176	3.0	24	11 A				
21	20.5	.149	77.0	E.	72	0.0	—	—				
22	26.0	.186	80.5	S.S.E.	74	1.0	14	8 P				
23	36.0	.239	93.5	S.S.E.	85	2.0	20	6 P				
24	39.0	.248	96.0	S.	59	0.5	10	7 A				
25	45.0	.313	96.0	S.E.	31	1.5	17	1 P	8 A	12 P	.01	
26	48.5	.372	95.0	S.S.W.	88	4.0	28	10 P	0 A	7 P	.03	
27	35.0	.292	70.5	W.N.W.	375	6.0	35	1 P				
28	28.0	.234	66.5	W.S.W.	305	2.5	22	1 P				
29	30.0	.243	71.0	W.S.W.	220	2.5	22	2 P				
30	41.0	.299	92.0	S.S.E.	92	1.5	17	7 P	9 A	11 P	.01	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

While the weather during November was generally seasonable, the records for some of the elements showed considerable departures from the normals. The most marked of the abnormal features was the small precipitation, increasing the shortage for the year considerably. A large wind movement was another prominent feature.

The temperature for the last week of the month was considerably higher than for the first week; an unusual feature for November, when the transition from autumn to winter is expected.

A comparison of the records for the month with those of former years shows the following features: The mean barometer was slightly lower than normal and the range slightly less than usual. The change in pressure was in general not especially rapid, considering the large wind movement.

The mean temperature was practically normal. The range was unusually small for November, due to a low maximum and high minimum. The minimum temperature was one of the three highest minimum records for November. The mean dew point was about normal while the relative humidity was high, due to considerable foggy weather.

The total precipitation was less than one-third the normal, more than half the amount occurring during a small snowstorm about the middle of the month.

The total wind movement was about thirty per cent. more than the average.

The amount of sunshine was nearly twenty per cent. less than the average and about half the days were cloudy.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 240. DECEMBER, 1908.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 29, 6th, 10 A.
Minimum reduced to freezing,	28.99, 12th, 2 P.
Reduced† maximum reading,	30.61, 6th, 10 A.
Reduced† minimum reading,	29.30, 12th, 2 P.
Mean semi-daily reduced,	30.045
Monthly range,	1.31

****Air Temperature.*** In Degrees Fahr.

Highest,	65.5, 1st, 2:30 P.
Lowest,	2.0, 24th, 6 A
Mean hourly,	27.1
Mean of means of max. and min.,	27.6
Mean sensible (wet bulb),	23.4
Monthly range,	63.5
Highest mean daily,	53.0, 1st
Lowest mean daily,	15.3, 23d
Mean maximum,	35.7
Mean minimum,	19.5
Mean daily range,	16.2
Greatest daily range,	31.5, 1st
Least daily range,	6.0, 8th

Humidity.

Mean dew point,	18.6
Mean force of vapor,	.145
Mean relative humidity,	75.1

Precipitation. In inches.

Total precipitation,	3.05
Number of days on which .01 inch or more rain or melted snow fell,	8
Total snow in inches,	9

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5432m.
Greatest daily movement,	415m., 2d.
Least daily movement,	28m., 11th.
Mean daily movement,	175 m.
Mean hourly velocity,	7.3 m.
Maximum pressure per square foot,	7.5 lbs.= 39m. per hour, 31st, 1P., W.
Maximum velocity for 5 minutes,	30m. per hour 18th, 9P., N.W.
Prevailing Direction,	West.

Summary.

West	36 per cent
West Southwest	10 " "
Northwest	13 " "
South,	16 " "
Other directions,	25 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	150 hrs.=53 per cent.
Number of clear days,	7
Number of fair days,	10
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, . . 133 hrs.=47%

Rain, 15th, 25th, 30th, 31st.

Snow, 2d, 4th, 7th, 11th, 12th, 13th, 18th, 21st, 25th, 30th.

Days Sleighing, 18

Gales, 35 miles or more per hour; 35m., 18th., N.W.: 35m., 19th, N.W.: 36m., 26th, N.S W.; 39m., 31st, W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.97	29.66	29.792	65.5	2:30 P	34.0	12 P	49 7	53.0	46.0	4.4
2	30.28	29.97	30.197	34.0	0 A	18.0	12 P	26.0	24.7	22.3	1.7
3	30 43	30.28	30.398	32.0	3 P	17.0	2 A	24 5	22.6	18.7	7.1
4	30.36	29.84	30 034	39.0	5:30 A	18.0	0 A	28.5	29 0	26.7	0.7
5	30.35	29.84	30.126	37 0	1130A	17.0	12 P	27.0	27.2	22.7	6 5
6	30.61	30.33	30.534	27.0	3 P	8.0	8 A	17.5	17.2	11 7	6.7
7	30.33	29.46	29.695	39.0	6:30 A	24.0	0 A	31 5	32.3	32.7	0.0
8	30.09	29.81	30.043	35.0	0 A	29 0	8:30 A	32.0	29 5	24.0	6.8
9	30.20	30.02	30.120	32.0	3 P	18 0	6 A	25 0	23 8	20.7	0.7
10	30.44	30.20	30.424	26.5	4 P	8.5	8 A	17.5	15.8	10.0	8.6
11	30.39	29.69	29.941	27.0	12 P	7.0	2 A	17.0	15.5	16.0	0.0
12	29.69	29.30	29.470	37.5	3 P	23 0	11:30P	30.3	29.8	26.5	2.9
13	29.72	29.60	29 673	29.5	12 M	15.0	8 A	22.3	24.3	19.5	2.9
14	30.06	29.69	29.964	42.0	2 P	16.5	6 A	29.3	28.7	23 0	8.0
15	30.05	29 96	30.033	46.0	2 P	32.0	12 P	39 0	36 9	33.5	6.0
16	30.14	30.02	30.123	40.0	2 P	27.0	12 P	33.5	33 0	28.7	2.3
17	30.20	30.06	30.153	27.0	4 P	18 0	8 A	22.5	23.0	18.3	3.6
18	30.09	29 51	29 768	28 0	9 P	18 0	8 A	23 0	21 3	20.0	0.0
19	30.07	29.80	30.004	34.5	2 P	7.0	7:30 A	20.7	21 9	16.7	7.5
20	30.01	29.80	29.919	35.0	1 P	25.0	0 A	30.0	28.9	25.3	6.0
21	30.22	29.88	30.050	42.5	2:30 P	26.0	0 A	34.3	31 9	27.5	6.3
22	30.53	30.22	30.482	32.0	0 A	15.0	12 P	23.5	23 4	18.7	5 4
23	30.44	30.36	30.394	26.0	4 P	7.0	12 P	16 5	15.3	11.3	6 0
24	30.36	29.94	30.160	33.0	12 P	2.0	6 A	17.5	17.7	16.5	1.7
25	29.94	29.45	29.623	39.0	3 P	31.0	12 P	35.0	34.8	32.0	2.4
26	29.82	29.45	29.670	37.0	1 P	26.0	6 A	31.5	32.6	29.3	1.7
27	29.93	29.79	29.814	36.0	3:30 P	28.0	7:30 A	32 0	32.5	27.7	6.1
28	30.31	29.88	30.235	34.5	4 P	25.5	12 P	30.0	31.1	25.0	8.3
29	30.48	30.22	30.361	41.0	2:30 P	19.0	8 A	30.0	27.5	22.0	7.3
30	30.53	29.90	30.295	35.0	11 P	17.0	6 A	26.0	23.4	22.5	0.0
31	30.08	29.78	29.903	38.0	2 P	28.0	12 P	33.0	32.3	29.3	5.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	43.5	.349	83.0	W.	270	5.0	32	12 P				
2	18.5	.128	81.0	W.	415	5.0	32	0 A	8 A	4 P		T
3	10.5	.117	63.0	W.S.W.	265	4.0	28	11 A				
4	23.0	.150	82.0	S.	243	4.0	28	3 P	8 A	7 P		T
5	18.5	.127	81.5	W.	200	4.5	30	2 P				
6	5.0	.085	68.0	W.	107	0.5	10	10 A				
7	30.0	.198	86.0	W.	111	5.5	33	11 P	0 A	8 P	1.68	2.0
8	15.5	.150	60.5	W.	303	4.5	30	5 A				
9	13.5	.125	68.0	W.N.W.	105	1.0	14	5 P				
10	3.5	.077	69.5	N.W.	160	1.0	14	1 P				
11	10.0	.101	74.5	N.N.E.	28	0.0	—	—	7 A	12 P	.22	2.0
12	23.0	.153	83.5	W.	129	4.5	30	6 P	0 A	11 A	.18	1.5
13	15.5	.117	80.0	S.	100	1.5	17	1 P	1 P	6 P	.06	0.5
14	16.0	.145	66.5	S.W.	120	1.0	14	4 P				
15	32.0	.203	85.5	S.S.E.	195	1.5	17	8 A	2 A	8 A	.10	
16	24.0	.171	79.0	W.	115	2.0	20	3 P				
17	14.0	.110	76 0	N.N.W.	120	2.0	20	2 P				
18	16.5	.116	83.0	N.W.	120	6.0	35	9 P	5 A	7 P	.35	2.5
19	12.0	.108	74.5	W.S.W.	130	6.0	35	1 A				
20	19.5	.149	74.5	S.W.	233	5.0	32	12 M				
21	23 0	.168	75.5	W.	207	5.5	33	4 P	5 P			T
22	15.5	.111	82.5	N.W.	177	2.0	20	2 A				
23	5.0	.082	69.5	N.W.	254	3.0	24	8 A				
24	19.0	.117	63.5	S.	90	2.0	20	5 P				
25	28.0	.195	78.5	S.	141	1.5	17	2 A	4:30 A	11 A	.01	0.5
26	23.0	.183	68.0	W.S.W.	182	6.5	36	12 M				
27	22.5	.167	74.0	S.	244	5.5	33	11 P				
28	16.0	.159	59.0	W.	286	4.5	30	1 P				
29	16.5	.130	76.0	W.N.W.	82	2.0	20	4 P				
30	19.0	.129	82.5	N.N.W.	86	1.0	14	3 A	1 P	12 P	*	T
31	24.5	.174	79.0	W.	214	7.5	39	1 P	0 A	2 A	.45	

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1908.

Pressure. In inches.

Maximum reduced to freezing, ... 30.49, Feb. 9, 8 A.
Minimum reduced to freezing. . . . . 28.56, Jan. 8, 1 A.
Maximum reduced to freezing and sea-level, ... 30.83, Feb. 9, 8 A.
Minimum reduced to freezing and sea-level, ... 28.86, Jan. 8, 1 A.
Mean reduced to freezing and sea-level, ... 30.044
Annual range, ... 1.97

****Air Temperature.*** In degrees Fahr.

Highest, ... 96.0, July 12, 1:30 P.
Lowest, ... —12.0, Feb. 5, 7 A.
Mean, ... 47.6
Mean of means of max. and min., ... 48.0
Mean sensible (wet bulb), ... 42.6
Annual range, ... 108.0
Highest mean daily, ... 80.0, July 7.
Lowest mean daily, ... 0.3, Feb. 5.
Mean maximum, ... 59.1
Mean minimum, ... 36.9
Mean daily range, ... 22.1
Greatest daily range, ... 49.0, Oct. 17.
Least daily range, ... 4.0, Nov. 11.

Humidity.

Mean dew point, ... 38.5
Mean force of vapor, ...387
Mean relative humidity, ... 75.8

Wind.

Prevailing direction, ... West Southwest

Summary.

South, Southwest, ... 9 per cent.
West, ... 11 " "
South, Southeast, ... 9 " "
Southwest, ... 9 " "
South, ... 11 " "
West, Northwest, ... 11 " "
Other directions, ... 40 " "
Total movement, ... 63.571 m.
Greatest daily movement, ... 594 m., Feb. 2.
Least daily movement, ... 10 m., Oct. 16.
Mean daily movement, ... 174 m.
Mean hourly velocity, ... 7.2 m.

Maximum pressure per square foot, 30.0 lbs.=80 m. per hour, Apr. 11, 6 P., N.N.W.
Maximum velocity for 5 minutes, 48 m. per hour, July 18, 12 M. S.S.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 30.68
Number of days on which .01 or more rain or melted snow fell, ... 109
Snow total in inches. 38.5

Weather.

Mean cloudiness observed, ... 41 per cent.
Total cloudiness recorded by Sun Thermometer, ... 1711 hrs.=39 per cent.
Number of clear days, ... 143
Number of fair days, ... 130
Number of cloudy days. 93

Bright Sunshine.

Number of hours recorded, 2743 hrs.=61 per cent.

Dates of Frosts.

Last, ... June 3d
First, ... Sept. 16th

Dates of Snow.

Last, ... April 20th
First, ... Nov. 3d
Total days of sleighing, ... 41

Gales of 50 or More Miles Per Hour.

Jan. 22d, 53 m., W. N. W.; 27th, 56m., S.W.
Feb. 2d, 68 m., N. W.; 7th, 51 m., N.N.W.
April 9th, 67 m., W. N. W.; 11th, 80m., N.N.W.; 12th, 55 m.; N.N.W.
May 2d, 51 m., S.

*Temperature in ground shelter.

R. C. LINDBLAD,
Observer.

J. E. OSTRANDER,
Meteorologist.

BULLETIN No. 241. JANUARY, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.42, 8th, 8 A. 16th, 7 P.
Minimum reduced to freezing, 28.80, 30th, 2 P.
Reduced† maximum reading, 30.75, 8th, 8 A. 16th, 7 P.
Reduced† minimum reading, 29.11, 30th, 2 P.
Mean semi-daily reduced, ... 30.148
Monthly range, ... 1.64

****Air Temperature.*** In Degrees Fahr.

Highest, ... 54.0, 5th, 4P.
Lowest, ... —7.0, 19th, 8 A.
Mean hourly, ... 25.7
Mean of means of max. and min., ... 25.4
Mean sensible (wet bulb), ... 22.8
Monthly range, ... 61.0
Highest mean daily, ... 45.3, 5th
Lowest mean daily, ... 5.3, 19th
Mean maximum, ... 34.4
Mean minimum, ... 16.4
Mean daily range, ... 18.0
Greatest daily range, ... 33.0, 6th
Least daily range, ... 6.0, 23d, 24th

Humidity.

Mean dew point, ... 19.0
Mean force of vapor, ...145
Mean relative humidity, ... 78.5

Precipitation. In inches.

Total precipitation, ... 3.56
Number of days on which .01 inch or more rain or melted snow fell, ... 10
Total snow in inches, ... 8

Wind.

Total movement, ... 5991m.
Greatest daily movement, . . . 342m., 26th.
Least daily movement, ... 36m., 23d.
Mean daily movement, ... 193 m.
Mean hourly velocity, ... 8.0 m.
Maximum pressure per square foot, 8.5 lbs.= 41m. per hour, 28th, 6P.. W.N.W.
Maximum velocity for 5 minutes, 36m. per hour 28th, 12P., N.W.
Prevailing Direction, West.

Summary.

North Northwest	19 per cent
South Southeast	16 " "
Northwest	13 " "
West Northwest	13 " "
West Southwest	10 " "
South, ...	10 " "
Other directions, ...	19 " "

Weather.

Mean cloudiness observed, ... 61 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 166 hrs.=56 per cent.
Number of clear days, ... 8
Number of fair days, ... 9
Number of cloudy days, ... 14

Bright Sunshine.

Number of hours recorded, . . 127 hrs.=44%
Rain, 3d, 4th, 5th, 6th, 9th, 10th, 12th, 14th, 23d, 24th, 25th.
Thunder and Lightning, 24th.
Snow, 9th, 12th, 13th, 14th, 16th, 17th, 18th, 25th, 26th, 27th, 29th, 30th.
Days Sleighing, ... 20
Gales, 35 miles or more per hour; 35m., 8th., N.N.W.; 40m., 18th, N.N.W.; 37m., 26th, N. W.; 41m., 28th., W. N. W.; 35m., 30th, N.NW.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.33	30.07	30.283	28.0	0 A	18.0	12 P	23 0	24.0	19.7	7.3
2	30.43	30.32	30.424	33.5	3 P	11.0	4 A	22.3	22.8	18.3	8.0
3	30.39	30.13	30.266	40.5	4 P	25.0	0 A	32.7	34.5	32.7	1.2
4	30.21	30.12	30.172	45.0	4 P	36.0	1 A	40.5	39 6	37.7	0.4
5	30.12	29.69	29.896	54 0	4 P	35.0	7 A	44.5	45.3	43.3	0.0
6	30.14	29.45	29.729	53.0	2 A	20.0	12 P	36.5	39.3	34 5	6.2
7	30.70	30.14	30.577	20.0	0 A	9.5	12 P	14.7	13.7	11.0	3.1
8	30.75	30.50	30.638	23.5	2 P	4.5	8 A	14.0	12.4	8.3	7.0
9	30.50	30.29	30.461	29.0	12 P	11.0	4 A	20 0	20.3	19 0	0.9
10	30.29	30.08	30.163	38.0	2 P	29.0	0 A	33 5	34.6	33.0	0.0
11	30.17	29.96	30.082	42.5	3 P	32.0	12 P	37.3	36.2	31.7	0.7
12	30.36	30 04	30.232	32.0	0 A	17.5	12 P	24 7	24.0	21.3	0.0
13	30.74	30.36	30.690	18.0	0 A	7.5	8 A	12.7	12.5	10 5	6.5
14	30.73	30.13	30.399	27.0	8:30 P	7.0	3 P	17.0	18.8	19 7	0.0
15	30.46	30 05	29.230	42.0	2 P	13.0	12 P	27.5	30 9	29.7	8.0
16	30.75	30.46	30.726	13.0	0 A	3.5	8 A	8.3	7.6	5.3	4.4
17	30.65	29.87	30.142	26.5	12 P	9 0	0 A	17.7	16 0	16.5	0.0
18	30.54	29 92	30.334	27 0	0 A	0 0	12 P	13.5	16 4	10.5	7.5
19	30 57	30.13	30.386	20.0	11 P	7.0	8 A	6.5	5.3	4.7	6.3
20	30.35	30.11	30.269	43.0	3:30 P	11.0	6 A	27.0	24.9	18.5	7.7
21	30.36	30.20	30.297	43.0	3 P	14.0	6:30 A	28.5	30.3	26.5	6.3
22	30.28	30.21	30.258	48.0	3:30 P	25.5	8 A	36.7	35.7	29 7	6 5
23	30.33	30.01	30.230	40.0	3 P	34.0	11 P	37.0	36.0	35 0	0.0
24	30.14	30 00	30.081	36.0	12 M	30.0	9 P	33.0	32.7	31.3	0.0
25	30.02	29 79	29.867	40.0	11 P	28 0	7 A	34.0	32 4	31.5	0.4
26	29.94	29.76	29.871	40.0	0 A	18.0	12 P	29 0	29.6	25.3	6.7
27	29.92	29.36	29.613	40.0	4 P	13.0	5 A	26 5	26.8	23 5	5.1
28	29.75	29.30	29.643	32 0	0 A	15 5	12 P	23 7	25.5	21.7	7.1
29	29 78	29.37	29.629	35.0	3 P	9.5	8 A	22.3	22.4	18.0	8.0
30	29.37	29.11	29.212	31.0	4 P	21.5	3:30 A	26.3	24.1	21.3	4.5
31	30.09	29.32	29.785	27.0	4 P	9.0	12 P	18.0	20.4	15 7	7.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	17.0	.114	82.5	W.S.W.	225	4.5	30	5 A				
2	15.0	.110	82.0	W.S.W.	155	2.0	20	11 A				
3	30.5	.202	86.0	S.S.E.	178	1.5	17	4 P	5:30 P		T	
4	36.0	.238	89.0	S.S.E.	149	1.0	14	2 A	7 A	10 A	T	
5	41.5	.304	90.5	S.	157	5.0	32	3 P	0 A	12 P	*	
6	33.0	.216	90.5	W.S.W.	293	5.5	33	1 P	0 A	3 A	1.51	
7	3.5	.081	64.0	W.N.W.	335	5.5	33	3 A				
8	−1.5	.074	59.0	N.W.	278	6.0	35	12 P				
9	16 5	.113	85.5	S.E.	60	0.5	10	2 P	2 P	12 P	T	T
10	29 5	.202	81.5	S.S.E.	163	1.0	14	12 M	0 A	2 P	.04	
11	27.5	.196	78.0	S.W.	167	2.5	22	6 P				
12	17.5	.126	81.0	N.N.W.	216	4.5	30	5 P	0 A	6 P	.36	1″
13	5.5	.078	76.5	N.N.W.	240	3.0	24	9 A	8:30 P	12 P	*	
14	17.0	.115	85.5	N.N.W.	148	0.5	10	2 P	0 A	10 P	.34	1.5
15	25.5	.182	78.5	N.W.	158	5.0	32	12 P				
16	−2.0	.062	66.0	N.N.W.	287	5.0	32	0 A	8:30 P	12 P		T
17	13.5	.103	84.0	N.N.W.	295	5.0	32	2 P	0 A	5 P	.85	4.5
18	3.0	.088	65.0	W.N.W.	317	8.0	40	11 P	10 A	7 P		T
19	14.0	.065	69.5	S.S.E.	149	4.0	28	1 A				
20	13.5	.130	74.5	S.S.E.	130	1.0	14	2 P				
21	18 5	.169	65.5	S.	144	3.0	24	11 A				
22	26.5	.178	68.0	S.	58	0.0	—	—				
23	32.5	.213	89.0	S.E.	36	0.0	—	—	5 P	12 P	*	
24	29.5	.181	92.5	N.	64	1.0	14	11 P	0 A	12 P	*	
25	28.5	.193	85.0	W.N.W.	88	2.5	22	10 P	0 A	2 A	.36	T
26	20.0	.152	74.5	N.W.	342	7.0	37	12 M	2 P			T
27	19.5	.143	80.0	S.S.W.	139	5.0	32	6 P	9 P			T
28	15 5	.129	74.0	W.N.W.	312	8.5	41	6 P				
29	12.5	.115	74.5	N.W.	89	1.5	17	12 P	7:30 P	12 P	.10	1″
30	17.0	.123	77.0	N.N.W.	287	6.0	35	9 A	0 A	8:30 P		T
31	8.5	.102	66.0	N.	332	5.0	32	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the first month of the year was generally seasonable although slightly warmer than usual. A high mean barometer and large wind movement were the most noticeable abnormal features. Thunder and lightning on the 24th seemed out of season.

A comparison of the records with the mean of twenty years for this station shows the following as the more important features for the month: The mean barometer about one-tenth of an inch above the normal while the maximum was higher and the minimum lower than usual giving a large range for the month. The total wind movement was about 25 per cent more than the normal with a large amount from the northwest quadrant.

The maximum temperature was nearly 4 degrees above the normal and the minimum nearly normal giving a large range for the month. The minimum fell below 0 Fahr. but once during the month. The mean temperature was about 1½ degrees above the normal.

The mean dew point and relative humidity were both above the normals for the month.

The total precipitation was slightly more than usual and fairly well distributed throughout the month. Less than half the total fell as snow so the total snowfall was not large. The heavy rainfall on the 5th and 6th was of much benefit in replenishing the municipal water supplies.

While there was sleighing more than half the month it was not generally good.

The amount of cloudiness observed was slightly more than usual.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 242. FEBRUARY, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 21, 14th, 10A.
Minimum reduced to freezing,	28.60, 20th, 6 A.
Reduced† maximum reading,	30.53, 14th, 10 A.
Reduced† minimum reading,	28.90, 20th, 6 A.
Mean semi-daily reduced,	29.958
Monthly range,	1.63

****Air Temperature.*** In Degrees Fahr.

Highest,	54.5, 6th, 2P'
Lowest,	—3.0, 4th, 7 A.
Mean hourly,	28.1
Mean of means of max. and min.,	29.3
Mean sensible (wet bulb),	24.9
Monthly range,	57.5
Highest mean daily,	41.9, 20th
Lowest mean daily,	7.5, 1st
Mean maximum,	38.6
Mean minimum,	20.2
Mean daily range,	18.4
Greatest daily range,	33.0, 10th
Least daily range,	3.5, 24th

Humidity.

Mean dew point,	21.0
Mean force of vapor,	15.5
Mean relative humidity,	78.0

Precipitation. In inches.

Total precipitation,	5.16
Number of days on which .01 inch or more rain or melted snow fell,	10
Total snow in inches,	5.0

Wind.

Total movement,	5585m
Greatest daily movement,	538m., 25th.
Least daily movement,	61m., 22d.
Mean daily movement,	199 m.
Mean hourly velocity,	7.1 m.

Maximum pressure per square foot, 18.5 lbs.= 61m. per hour, 25th, 8A., N.

Maximum velocity for 5 minutes, 36m. per hour 25th, 8A, N.

Prevailing Direction, Northwest.

Summary.

West Northwest	18 per cent
North	14 " "
Northwest	14 " "
West Southwest	14 " "
West Northwest	11 " "
South,	11 " "
Other directions.	18 " "

Weather.

Mean cloudiness observed,	60 per cent
Total cloudiness recorded by the Sun Thermometer,	139 hrs.= 47per cent.
Number of clear days,	10
Number of fair days,	8
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded. . . 157 hrs.=53%

Rain, 5th, 9th, 10th, 16th, 19th, 20th, 23d, 24th.

Thunder and Lightning, none.

Snow, 9th, 10th, 11th, 14th, 15th, 16th, 23d. 27th.

Days Sleighing, ... 13

Gales, 35 miles or more per hour: 35m., 1st., N.N.W.; 54m., 6th. S.; 35m., 8th, W.N. W.; 39m., 10th., W. N. W.; 35m., 11th, W.S.W.; 35m, 17th, W., 48m, 20th. N.N.W.; 35m, 21st, N.; 61m. 25th, N.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.34	30.09	30.328	19.0	2:30 P	0.0	7 A	9.5	7.5	3.0	8.3
2	30.29	29.96	30.075	30.5	2 P	4.5	7 A	17.5	17.6	14.5	4.4
3	30.12	29.98	30.046	27.5	2 P	5.0	12 P	16.3	15.1	8.3	9.1
4	29 98	29.68	29.835	29 0	4 P	−3.0	7 A	13.0	14.8	12.0	6.3
5	29.74	29.58	29.687	53.0	2:30 P	20.5	2 A	36.7	35.7	33.5	7.0
6	29.91	29.22	29.545	54 5	2 P	30.5	12 P	42.5	41.2	38.3	2.1
7	30.15	29.91	30.085	39.0	3 P	24.0	7 A	31.5	30.7	26.5	8.8
8	30.12	29.88	30.005	41.5	0:30 P	24.0	7:30 A	32.7	30.6	25.7	7.4
9	30.35	30.11	30.291	26.0	0 A	10 0	7:30 A	18 0	17.8	13.7	5.4
10	30.11	29.23	29.587	52.0	3:30 P	19.0	3 A	35.5	29.5	31.5	0.0
11	30.06	29.58	29.830	30.0	0 A	23.0	12 P	26.5	26 4	23.0	6.0
12	30.32	30.06	30.265	37.0	2:30 P	18.5	7 A	27 7	28.5	25.7	9.0
13	30.26	29.96	30.074	52.0	3:30 P	32.5	0 A	42.3	40.3	38 3	6.1
14	30.53	30.26	30 411	37.0	0 A	24.0	10 A	30.5	27.4	24.3	0 0
15	30.29	30 08	30.177	29.0	12 M	24.5	0 A	26.7	26 9	26.0	0.0
16	30.08	29.72	29 898	36 5	1 P	22.0	10 P	29.3	28.3	25.3	0.0
17	30.04	29.66	29.948	33.5	2:30 P	20 0	12 P	26.7	24 8	23 0	9.6
18	30.35	30.04	30.279	34 0	1 P	20 0	0 A	27 0	26 7	24 7	8 6
19	30.35	29.35	29 955	48.0	12 P	21.5	1 A	34.7	28 2	26 7	0.0
20	29.61	28.90	29.244	51.0	2 A	36 0	12 P	43 5	41.9	38.3	2.1
21	30.03	29.61	29.989	41.0	4 P	31.0	12 P	36.0	34 8	28 5	9.1
22	30.29	30 03	30.216	51.0	4:30 P	24.0	7 A	37 5	35 2	29.5	10 0
23	30.44	30.13	30.327	40.0	5 P	25.5	7 A	32.7	32.8	28 5	4 0
24	30.13	29.30	29.581	36.5	12 P	33.0	6 A	34.7	35 2	34 0	0.0
25	29.90	29.32	29.653	36.5	0 A	17.0	12 P	26.7	24.9	20 5	9.6
26	30 01	29.81	29.933	31.5	4 P	16.0	7 A	23.7	22.8	19.7	10.3
27	29 81	29 59	29 676	46.5	3 P	21.0	7 A	33.7	31.9	27.7	6.6
28	30.08	29'68	29.899	37.0	1P	21.0	12 P	29 0	30.0	27.0	7 6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	−2.0	.055	75.0	N.N.W.	201	6.0	35	11 A				
2	13.0	.100	69.0	W.S.W.	180	3.5	26	2 P				
3	−0.5	.072	63.0	W.S.W.	118	1.0	14	4 P				
4	12.0	.095	76.5	S.	87	1.5	17	6 P				
5	30.5	.221	84.0	S.	150	2.5	22	11 P	7 P	10 P	T	
6	37.0	.243	89.5	S.S.W.	410	14.5	54	5 P				
7	23.0	.155	82.5	N.W.	175	1.5	17	1 A				
8	22.0	.150	80.5	W.N.W.	246	6.0	35	2 P				
9	6.0	.094	65.5	W.N.W.	166	3.0	24	1 A	3 P	12 P	*	1.5
10	30.0	.185	92.5	N.W.	151	7.5	39	4 P	0 A	8 P	1.20	T
11	19.5	.133	81.5	W.S.W.	287	6.0	35	1 P	5 A			T
12	22.0	.150	82.0	S.	284	3.5	26	5 P				
13	35.5	.247	83.5	W.S.W.	238	3.0	24	5 A				
14	20.0	.141	79.5	N.N.W.	187	1.5	17	1 P	6 P	12 P	.36	1
15	24.5	.147	91.0	N.N.W.	105	0.0	—	—	0 A	12 P	.35	.5
16	21.0	.147	79 5	N.	120	0.5	10	10 A	0 A	12 P	1.12	1.5
17	21.0	.131	87.5	W.N.W.	122	6.0	35	11 A				
18	21.0	.142	82.0	W.N.W.	224	4.0	28	8 A				
19	22.5	.160	77.5	S.E.	71	4 0	28	12 P	11 A	12 P	*	T
20	34.5	.253	80.5	N.W.	425	11.5	48	4 P	0 A	6 A	.41	
21	20.5	.185	61.5	N.	350	6.0	35	5 A				
22	22.0	.193	63.5	W.N.W	61	0.0	—	—				
23	24.0	.169	78.5	N.	62	0.5	10	7 P	5 P	12 P	.41	T
24	31.5	.206	86.0	N.N.E.	106	0.5	10	10 P	0 A	9 P	1.28	
25	14.5	.124	73.0	N.	538	18.5	61	8 A				
26	14.5	.118	75 5	N.N.W.	322	3.5	26	11 A				
27	25.5	.163	86.0	N.W.	68	3.5	26	7 P	8 P	10 P	.03	.5
28	23.5	.156	83.5	N.E.	131	2.5	22	6 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month, while fairly seasonable in character, was marked by sudden changes and large fluctuations in a number of the more important elements. Perhaps the most noticeable were the high temperature, large precipitation, small amount of snow and large wind movement.

A study of the records shows the following as the principal departures from the normals: The mean barometer was considerably lower than usual and the range large even for February. The minimum record was extremely low for this locality, and was reached by an unusually rapid fall,—an inch in about fourteen hours. Large fluctuations were pronounced throughout the month. The total wind movement was considerably more than the normal, and largely from the northwest quadrant.

The mean temperature was about six degrees higher than usual, and the maximum and minimum records were both high. The maximum record followed the minimum for the month, in 55 hours, giving the monthly range in an unusually brief time. The temperature fell below zero on but a single date.

The mean dew-point was about four degrees above the normal, and the relative humidity slightly higher than usual.

The total precipitation was about two inches more than the normal and well distributed throughout the month. Only a comparatively small part of it occurred as snow.

The cloudiness observed was slightly more than the average. There was sleighing about half the month, but part of the time it was comparatively poor.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 243. MARCH, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 04, 12th, 7 A.
Minimum reduced to freezing,	28.54, 25th, 10 P.
Reduced† maximum reading,	30.36, 12th, 7 A.
Reduced† minimum reading,	28.84, 25th, 10 P.
Mean semi-daily reduced,	29.823
Monthly range,	1.52

****Air Temperature.*** In Degrees Fahr.

Highest,	54.0, 24th, 4:30 P ; 27th 2 P.
Lowest,	13.0, 1st, 7 A.
Mean hourly,	32.4
Mean of means of max. and min.,	33.2
Mean sensible (wet bulb),	29.5
Monthly range,	41.0
Highest mean daily,	41.0, 31st
Lowest mean daily,	21.0, 5th
Mean maximum,	41.5
Mean minimum,	25.0
Mean daily range,	16.5
Greatest daily range,	31.0, 24th
Least daily range,	6.0, 5th

Humidity.

Mean dew point,	26.0
Mean force of vapor,	.180
Mean relative humidity,	81.3

Precipitation. In inches.

Total precipitation,	3.01
Number of days on which .01 inch or more rain or melted snow fell,	12
Total snow in inches,	3.5

Wind.

Total movement,	7034m.
Greatest daily movement,	461m., 5th.
Least daily movement,	37m., 10th.
Mean daily movement,	227m.
Mean hourly velocity,	9.5 m.

Maximum pressure per square foot, 18.0 lbs.= 60m. per hour, 25th, 2P., SE.

Maximum velocity for 5 minutes, 45m. per hour 25th, 2 P., SE.

Prevailing Direction, North Northwest.

Summary.

North Northwest	26 per cent
West Southwest	19 " "
Northwest	16 " "
North	16 " "
North Northeast	13 " "
Other directions,	10 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	139 hrs.= 37per cent.
Number of clear days,	12
Number of fair days,	11
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, . . 232 hrs.=63%

Rain, 2d, 9th, 10th, 25th, 27th.

Thunder and Lightning, none.

Snow, 2d, 3d, 4th, 7th, 11th, 13th, 14th, 16th, 17th, 18th, 19th, 26th, 28th, 30th.

Days Sleighing, 0

Gales, 35 miles or more per honr; 41m., 5th., N.N.W.; 57m., 11th, N.; 35m., 12th, N.; 35m., 17th., N. N. W.; 38m., 20th, N.E.; 36m, 22d, N.E.; 60m, 25th, S.E.; 35m, 27th, S.W.; 35m, 29th, N.N.W.; 36m. 31st, N.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.29	30 00	30.182	37.0	4:30 P	13.0	7 A	25.0	25.2	21.5	10.2
2	30.00	29.73	29.808	49.0	4 P	26.0	0:30 A	37.5	36.5	34.0	5.8
3	29.85	29.57	29.767	35.5	4 P	27.0	7 A	31.3	30.9	29.5	0.7
4	29.57	29.03	29.207	32.0	4 P	22.0	12 P	27.0	26 4	22.7	2.5
5	29.89	29.17	29.646	25.0	4 P	19.0	10 P	22.0	21.0	18.7	8.0
6	30.05	29.84	29.985	38.5	5 P	16.0	6 A	27.3	26.8	24.7	10.7
7	29.84	29.75	29.812	34 0	11 P	18.0	6:30 A	26.0	27.5	24 5	2.4
8	30.18	29.81	30.110	40.5	3 P	26.0	7 A	33.3	32.8	29 7	10.3
9	30.26	29.88	30.122	30.5	12 P	21.0	7 A	25.7	26.8	26.5	2.5
10	29.88	29.49	29.641	40.0	11 P	30.5	0 A	35.3	33.9	32.5	1.2
11	30.29	29.63	30.048	42.5	2 A	25 5	11 P	34.0	31.6	26.5	9.7
12	30.36	30.21	30.307	40 5	3 P	24.5	3 A	32.5	32.1	24.7	10.5
13	30.21	29.86	30.033	38.5	3 P	30 0	6 A	34.3	34.0	31.3	1.4
14	29.86	29.68	29.801	44.5	4 P	31.0	12 P	37.7	34.7	30.0	7.2
15	30.09	29.80	29.969	40.0	4 P	25 0	12 P	32.5	31 4	28 0	11.3
16	30.16	29.81	30.025	39 0	4 P	17.5	7 A	28 3	29 5	27.5	9.2
17	29 88	29.68	29.805	36.0	1 P	25.0	12 P	30.5	30.0	27.5	10.6
18	30.06	29 85	29.991	38.0	4:30 P	22 5	6 A	30.3	28.7	26 0	10 9
19	30.06	29.72	29.918	41.5	4 P	19 0	6 A	30.3	31.7	29.7	8.0
20	29.91	29.66	29.763	42 0	2 P	27.0	12 P	34.5	34 3	31 3	7.1
21	29.98	29 87	29.970	44.0	3 P	22.0	7 A	33 0	30.5	25 5	11.5
22	30.00	29.89	29.991	39.5	4 P	20.0	6 A	29.7	27.4	26 5	11.0
23	30.03	29.90	29 994	47.0	4:30 P	26.0	7:30 A	36.5	34.9	32 7	11.5
24	29.99	29.71	29 877	54.0	4:30 P	23.0	7 A	38 5	38.3	35.0	10.5
25	29.71	28.84	29.185	50.0	8 P	33.0	4 A	41.5	39.4	41 5	0.0
26	29 69	28.86	29 471	40.0	4:30 P	33 0	12 P	36 0	35 9	31.3	3 0
27	29.79	29.55	29.693	54.0	2 P	28.0	6:30 A	41 0	39 4	35.5	8.6
28	29.62	29.38	29.491	48.5	5 P	32.0	9 A	40 3	38 5	34.0	7 0
29	29 60	29 46	29 579	46.0	12 M	31.5	4:30 A	38 7	37.3	35.0	8.2
30	29.60	29.49	29 582	46 0	2 P	29.0	6 A	37.5	36.3	33.5	9.5
31	29 81	29.60	29.747	52.0	2:30 P	31.5	2 A	41.7	41.0	36.5	11.4

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	16.0	.132	75.0	W.S.W.	172	3.5	27	10 P				
2	32.0	.208	86.0	W.S.W.	238	2.5	22	0 A	2 A	9 A	.12	½
3	27.5	.170	90.0	E.	174	3.5	27	12 P	11 P	12 P	.01	T
4	20.0	.130	84 0	N.N.E.	327	5.0	32	10 A	0 A	9 P	.21	2
5	16.0	.111	86.0	N.W.	461	8.5	41	1 P				
6	21.0	.143	82.0	N.W.	231	2.0	20	1 A				
7	21.0	.143	85.0	W.S.W.	61	0.5	10	8 P	11:30A	7 P	.01	T
8	26.5	.176	82.0	N.	253	5.5	33	1 A				
9	24.5	.149	91.0	N.	51	0.0	—	—	11 A	12 P	.20	
10	30.0	.193	89.0	N.	37	3.0	24	12 P	0 A	5 P	.37	
11	24.0	.154	86.0	N.N.W.	444	16.0	57	8 A	6 A	3 P		T
12	26.0	.177	82.0	N.	272	6.0	35	2 A				
13	28.5	.188	83.0	N.N.W.	54	1.0	14	9 A	11 A	12 P	.03	
14	24.5	.166	72.5	N.	72	2.5	22	4 P	0 A	10 A	.04	½
15	23 0	.169	76.5	N.N.W.	239	4.0	28	10 A				
16	23.0	.166	76.0	W.S.W.	177	3.0	24	2 P	10 P	12 P		T
17	24.5	.159	86.0	N.N.W.	307	6.0	35	1 P	0 A	12 P		T
18	22.5	.151	83 0	N.N.W.	370	5.5	33	9 A	0 A	2 A		T
19	25.5	.178	79.0	N.W.	70	0.5	10	12 M	8 P	12 P	.07	½
20	28.0	.186	82.5	N.N.E.	215	7.0	38	2 P				
21	21.5	.152	77.0	N.N.E.	195	3.5	26	11 P				
22	24.5	.149	91.5	N.E.	352	6.5	36	12 M				
23	29.0	.202	79.0	N.N.E.	291	4.5	30	4 P				
24	30.5	.228	76.5	W.S.W.	91	1.5	17	7 P				
25	39.5	.286	88.0	S.E.	351	18.0	60	2 P	2 A	11 P	1.88	
26	25.0	.192	71.0	N.W.	335	5 0	32	4 P	9 A	3 P		T
27	30 0	.232	73 5	W.S.W.	210	6 0	35	2 P	4 P	6 P	.02	
28	31.5	.208	86.5	N.N.W.	133	4.5	30	12 M	2 A	11 A	.05	T
29	30.5	.227	74 5	N.W.	361	6 0	35	10 A				
30	28.5	.215	73.5	N.N.W.	216	3.0	24	10 A	2 P	3 P		T
31	31.0	.247	72.0	N.N.W.	274	6.5	36	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during March presented a number of features out of the ordinary when compared with former records. The most prominent of the abnormal features was the barometric record. The wind movement and range of temperature were also unusual records for the station.

Comparing the records with those of former years the following features are noted: The mean barometer made a new low record for March at this station. The minimum pressure was also lower than any previous March record here. The only mean monthly barometer for any month on our records, showing a lower pressure is that of April 1889, with a record of 29.795 inches. The minimum records for January 1891, February 1895 and 1896 and Nov. 1904 are the only lower mimimum records since the establishment of the station.

The total wind movement was large, being about thirty per cent more than the March normal. It was, however, about 1150 miles less than the highest March record.

Although the month seemed warmer than usual, the maximum temperature was more than 7 degrees lower than the normal and the minimum more than 8 degrees higher than the normal—giving the smallest range for March on our records.

The mean dew point was practically normal while the relative humidity was 7 per cent above the average.

The total precipitation was about three-fourths of the normal and over 60 per cent of the total occurred on a single date.

The amount of sunshine was considerably more than normal and the number of cloudy days comparatively few. The month closed with every indication of an early spring season.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 244. APRIL, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 29, 11th, 8 A. 12th, 6 A.
Minimum reduced to freezing, 29.17, 7th, 6 P.
Reduced† maximum reading, 30.60, 11th, 8 A. 12th, 6 A.
Reduced† minimum reading, 29.46, 7th, 6 P.
Mean semi-daily reduced, ... 30.064
Monthly range, ... 1.14

****Air Temperature.*** In Degrees Fahr.

Highest, ... 80.0, 19th, 2 P.
Lowest, ... 19.0, 11th, 6 A.
Mean hourly, ... 44.4
Mean of means of max. and min., ... 45.1
Mean sensible (wet bulb), ... 40.0
Monthly range, ... 61.0
Highest mean daily, ... 58.8, 7th
Lowest mean daily, ... 31.4, 10th
Mean maximum, ... 56.4
Mean minimum, ... 33.8
Mean daily range, ... 22.6
Greatest daily range, ... 35.5, 5th
Least daily range, ... 8.0, 3d

Humidity.

Mean dew point, ... 35.5
Mean force of vapor, ...291
Mean relative humidity, ... 76.3

Precipitation. In inches.

Total precipitation, ... 5.53
Number of days on which .01 inch or more rain or melted snow fell, ... 18
Total snow in inches, ... trace

Wind.

Total movement, ... 6679m.
Greatest daily movement, . . . 705m., 8th.
Least daily movement, ... 64m., 23d.
Mean daily movement, ... 223m.
Mean hourly velocity, ... 9.3 m.
Maximum pressure per square foot, 27.5 lbs.= 74m. per hour, 8th, 10 A., NNW.
Maximum velocity for 5 minutes, 44m. per hour 8th, 10 A., NNW.
Prevailing Direction, Northwest.

Summary.

West Southwest	20 per cent.
North Northwest	17 " "
North	13 " "
North Northeast	10 " "
Northeast	10 " "
West	10 " "
Other directions, ...	20 " "

Weather.

Mean cloudiness observed, ... 52 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 181 hrs.= 45 per cent.
Number of clear days, ... 10
Number of fair days, ... 11
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . 220 hrs.=55%

Rain, 2d, 3d, 6th, 7th, 9th, 13th, 14th, 15th. 17th. 19th, 21st, 22d, 23d, 25th, 26th, 27th. 28th, 29th, 30th.

Snow, 19th, 29th.

Thunder and Lightning, 19th, 21st.

Hail, 19th.

Last Frost, 27th.

Gales, 35 miles or more per hour; 35m., 4th., N.N.W.; 51m., 7th, N. N. W.; 74m., 8th, N. N. W.; 35m., 10th, N.; 35m., 11th, N.E.; 52m., 12th, W.; 47m., 13th., W.; 49m., 14th, W.; 60m., 19th, W. S. W.; 35m., 25th, W. S. W.; 40m., 28th, N.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.08	29.81	30.008	52.0	4:30 P	27.0	5 A	39.5	39.0	35.3	12.1
2	30.11	29.88	29.993	58.0	4 P	24.0	6 A	41.0	41.5	37.5	11.1
3	29.89	29.65	29.729	44.0	5 P	36.0	12 P	40.0	39.2	37.3	0.4
4	30.00	29.65	29.830	52.0	3:30 P	29.0	6 A	40.5	40.7	35.5	11.2
5	30.14	30 00	30.105	64.5	3:30 P	29.0	6 A	46.7	47 0	42.7	11.3
6	30.11	29.87	29.985	70.5	3:30 P	40.0	5:30 A	55.3	55.2	53.0	7.6
7	29.87	29.46	29.703	76.5	3 P	48.0	12 P	62.3	58.8	49.7	8.5
8	30.11	29.71	29.976	51.0	3 P	40.5	6 A	45.7	44.0	36.7	11.6
9	30.06	29.69	29.798	44.5	4 P	30.5	12 P	37.5	35.0	31.7	0.6
10	30.38	29.77	30.076	42.0	2 P	23.0	12 P	32.5	31.4	26.5	9.8
11	30.60	30.38	30.589	49.0	5 P	19.0	6 A	34.0	32.2	28.0	12.0
12	30.60	30.40	30.506	57.0	2 P	27.0	6 A	42.0	41.8	38.5	10.1
13	30.41	30.07	30.210	71.0	2 P	42.0	0 A	56.5	56.6	51.5	7.9
14	30.15	29.97	30.080	60.0	9 A	42.0	12 P	51.0	54 6	53.5	0.0
15	30.28	30.08	30.171	58.0	5 P	39.0	6 A	48.5	43.6	39.7	1.5
16	30.36	30.24	30.329	65.5	5 P	33.0	6 A	49.3	48.3	41.7	11.7
17	30.32	30.04	30.204	60.5	3:30 P	40.0	4 A	50.3	48.5	45.5	0.0
18	30.24	29.97	30.115	64.0	1 P	33.0	7 A	48.5	50.7	44.0	10.5
19	29.97	29.56	29.785	80.0	2 P	46.0	6 A	63 0	58.7	53.5	5.8
20	30.16	29.81	30.071	51.0	4 P	40.5	7 A	45.7	45.8	40.5	2.0
21	30.25	29.98	30.151	50.0	1 P	40.5	7 A	45.3	44.1	41 0	1.7
22	29.98	29.72	29.813	65.0	3:30 P	40.5	5 A	52.7	50.7	45.7	10.0
23	29.99	29.81	29.915	51.0	10 A	37.0	12 P	44.0	43.4	39.5	1.5
24	30.37	30.00	30.239	52.0	2 P	31.0	5 A	41.5	40.3	34.7	13.7
25	30.42	29.87	30.150	54.5	2:30 P	24.0	6 A	39.3	41.7	38.5	9.0
26	30.09	29.83	29.980	52 0	1 P	34.0	12 P	43.0	45.0	39.0	8.9
27	30.16	29.93	30.052	58.0	2:30 P	26.5	6 A	42.3	42.0	37.3	9 7
28	30.24	29.85	30.064	51.0	4 P	33.0	12 P	42.0	41.9	35.7	11.9
29	30.35	30.17	30.306	49.0	2 P	27.0	5 A	38.0	36.7	32.3	7.6
30	30.22	29.88	29 985	39.0	4 P	32.0	3 A	35.5	35.6	35.7	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	30.0	.234	72.5	N.	167	3.5	26	1 P				
2	32.5	.266	73.5	S.W.	168	1.5	17	8 P	9 P	12 P	.08	
3	35.5	.230	89.5	N.E.	101	0.5	10	2 P	0 A	7 P	.12	
4	31.0	.233	76.5	N.N.W.	221	6 0	35	10 A				
5	38.5	.314	76.5	W.S.W.	98	2.0	20	6 P				
6	50.5	.448	85 5	W.S.W.	176	2.0	20	12 M	7 P	12 P	.03	
7	45.0	.430	69.5	N.N.W.	172	13 0	51	11 P	0 A	2 A	.01	
8	28.0	.265	61.0	N.N.W.	705	27.5	74	10 A				
9	29.5	.188	88 0	N.N.W.	169	2.0	20	3 P	4 A	11 P	.04	T
10	21.5	.160	73.0	N.	376	6.0	35	2 P				
11	21.0	.174	69 0	N.N.E.	204	6.0	35	5 P				
12	36.0	.254	84.0	W.	319	13.5	52	2 P				
13	48.0	.443	76.5	W.	445	11.0	47	5 P	9 P	12 P	.13	
14	52.5	.447	95.0	N.W.	344	12.0	49	3 A	0 A	12 P	2.51	
15	39.0	.254	92 0	N.N.E.	200	2.0	20	7 A	0 A	10 A	.52	
16	32.0	.348	52.5	N.N.E.	127	3.0	24	9 A				
17	42.5	.343	84 0	W.S.W.	215	1.5	17	9 A	6 A	10 A	.05	
18	40.0	.331	78.0	W.S.W.	117	3.5	26	12 M				
19	51.5	.468	85.0	W.	189	18.0	60	3 P	3:30 P	8 P	.05	
20	37.5	.280	79.5	N.E.	269	4.0	28	8 A				
21	38.5	.271	88.5	E.S.E.	162	1.5	17	12 M	5 P	12 P	.11	
22	43.5	.335	87.0	N.N.W.	151	2.0	20	2 P	0 A	8 A	.22	
23	32.0	.293	63.0	N.W.	64	0.5	10	4 P	10 A	3 P	.48	
24	28.0	.237	64.5	N.	297	5.5	33	10 A				
25	33.0	.273	73.0	W.S.W.	230	6.0	35	3 P	6 P	12 P	.01	
26	31.0	.292	61.0	N.E.	280	3.0	24	12 M	0 A	1 A	T	
27	31.0	.262	67.0	W.S.W.	213	3.5	26	3 P	10 P	12 P	.05	
28	28.5	.250	61.5	N.	313	8.0	40	2 P	0 A	6 A	.60	
29	25.0	.208	69.0	W.N.W.	120	0.5	10	12 M	7:30 P	12 P	.02	T
30	34.5	.213	95.5	E.S.E.	67	0.0	—	—	0 A	12 P	.50	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The most marked feature of the weather during the month was the heavy wind storm on the 8th. From 8 P. M. on the 7th to 8 P. M. on the 8th the total wind movement was 705 miles as recorded by the anemometer. This exceeds any previous daily record at this station. The maximum wind pressure, while high, was considerably less than the station's high record. The wind did considerable damage to trees in the town. The total precipitation was nearly 90 per cent more than the normal and only about half an inch less than our maximum April record. On the evening of the 29th considerable snow fell but as it melted on reaching the ground it is only recorded as a trace.

Other features of interest were not so marked. The mean barometer was high and the maximum and minimum both considerably greater than the normals. Fluctuations in pressure were not especially pronounced for the time of year.

The mean temperature was but slightly less than the normal, while the maximum was higher and the minimum lower than usual, giving a rather large range. The last three days of the month were colder than the first three.

The mean dew point was practically normal and the relative humidity nearly 10 per cent more than the average record.

More than half the total rainfall occured during an especially heavy storm about the middle of the month.

The total wind movemsnt was about 30 per cent more than usual, although it was more than 1500 miles less than for April, 1908.

The month closed with the season considerably more backward than at the beginning of the month.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 245. MAY, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.99, 21st, 6 A.
Minimum reduced to freezing,	29.17, 1st, 3P.
Reduced† maximum reading,	30.29, 21st, 6 A.
Reduced† minimum reading,	29.47, 1st, 3 P.
Mean semi-daily reduced,	29.938
Monthly range,	0.82

****Air Temperature.*** In Degrees Fahr.

Highest,	81.5, 15th, 4 P.
Lowest,	32.5, 3d, 5 A.
Mean hourly,	55.5
Mean of means of max. and min.,	55.7
Mean sensible (wet bulb),	49.9
Monthly range,	49.0
Highest mean daily,	68.5, 15th
Lowest mean daily,	38.5, 1st
Mean maximum,	67.1
Mean minimum,	44.4
Mean daily range,	22.7
Greatest daily range,	39.0, 13th, 31st
Least daily range,	8.0, 1st

Humidity.

Mean dew point,	45.1
Mean force of vapor,	.448
Mean relative humidity,	71.2

Precipitation. In inches.

Total precipitation,	3.36
Number of days on which .01 inch or more rain or melted snow fell,	16

Wind.

Total movement,	5371m.
Greatest daily movement,	362m., 10th.
Least daily movement,	62m., 28th.
Mean daily movement,	173m.
Mean hourly velocity,	7.2 m.

Maximum pressure per square foot, 8.0 lbs.= 40m. per hour, 2d, 4 P., WNW.

Maximum velocity for 5 minutes, 32m. per hour 2d, 4 P., WNW.

Prevailing Direction, North Northwest.

Summary.

West Southwest	16 per cent.
North Northwest	13 " "
North	13 " "
North Northeast	10 " "
Northeast	10 " "
East Southeast	10 " "
West Northwest	10 " "
Other directions,	18 " "

Weather.

Mean cloudiness observed,	56 per cent.
Total cloudiness recorded by the Sun Thermometer,	190 hrs.= 42per cent.
Number of clear days,	13
Number of fair days,	11
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, 263 hrs.=58%

Rain, 1st, 3d, 4th, 5th, 6th, 7th, 9th, 10th, 11th. 14th, 16th, 17th, 18th, 19th, 22d, 23d, 24th, 27th, 28th, 29th.

Light Frost, 12th.

Thunder and Lightning, 6th, 7th, 10th, 14th, 27th, 28th, 29th.

Hail, 5th.

Gales, 35 miles or more per hour; 40m. 2d, W.N.W.; 37m. 10th, W.S.W.; 35m. 30th, N.N.E.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.91	29.47	29.669	43.0	2 P	35.0	6 A	39.0	38.5	37.3	0.0
2	30.07	29.65	29.931	54.0	3 P	33.0	6 A	43.5	42.7	37.3	10.3
3	30.16	29.93	30.051	50.0	12 M	32.5	5 A	41.3	48.3	41.7	12.5
4	29.96	29.80	29.914	61.0	4 P	39.0	12 P	50.0	51.0	42.7	11.0
5	29.91	29 80	29.873	62.5	5 P	38.0	1 A	50.3	49.5	46.7	5.8
6	29.97	29.74	29.846	82.0	2 P	50.5	2:30 A	66.3	65.0	57.7	11.3
7	30.05	29.86	29.978	74.0	5 P	46.0	6 A	60.0	57.5	48.5	10.1
8	30.11	29.95	30.093	74.0	4:30 P	45.5	5 A	59.7	58.5	54 0	12.0
9	30.11	29.90	30.009	69.0	12 M	43.0	5 A	56.0	57.4	52.0	9.2
10	29.90	29.69	29.809	75.0	1 P	55.0	5 A	65.0	63.6	52.0	8.1
11	29.95	29.62	29.807	61.0	0 A	45.0	12 P	53.0	56.0	50.3	8.9
12	30.12	29.95	30.091	72.5	4 P	35.0	6 A	53.7	56.3	46.7	13.3
13	30.14	29.88	30.028	77.5	4 P	38.5	5 A	58.0	60.3	50.7	12.3
14	29 95	29.76	29.865	79.0	4 P	53.0	6 A	66.0	65 0	56.3	9.5
15	29.84	29.76	29.814	81.5	4 P	57.0	12 P	69.3	68.5	59.7	13.0
16	29.86	29.72	29.812	61.0	12 M	51.0	12 P	56.0	54.9	51.0	0.0
17	29.95	29.85	29.924	58.0	2 P	49.0	6 A	53.5	51.8	50.5	0.1
18	30.02	29.90	29.953	63.5	4 P	48.0	5 A	55.7	54.9	53.0	6.2
19	30.16	30.00	30.092	69.0	2 P	51.0	5 A	60.0	56.5	53.5	7.6
20	30.26	30.16	30.231	65.0	4 P	47.0	5 A	56 0	54.6	51.5	8.1
21	30.29	30.15	30.240	59.0	2 P	41.0	5 A	50.0	50.2	41.3	8.0
22	30.15	29.94	30.062	50.0	2 P	39 5	11:30P	44.7	44.5	41.5	0.0
23	29.94	29.77	29.847	64.0	4 A	40.0	0 A	52.0	51.5	43.0	7.2
24	29.86	29.73	29.828	73.5	2 P	48.0	5 A	60.7	56.8	52.5	9.3
25	30.22	29.83	30.081	68.5	5 P	41.0	12 P	54.7	54.0	48.5	13.7
26	30.24	30.11	30.224	75.5	4:30 P	37.0	5:30 A	56.3	57.5	51.7	13.2
27	30.20	29.85	30 033	66.0	12 M	43.5	5 A	54.7	56.7	55.3	4 7
28	29.85	29.63	29.701	66.5	2 P	55.0	12 P	60.7	58.8	56.7	0.7
29	29.74	29 60	29 685	72.0	3 P	51.0	12 P	61.5	59.3	54.5	9 0
30	29.85	29.67	29.755	73.0	5 P	46 0	6 A	59.5	59.0	52.5	13.6
31	29.87	29.70	29.820	80.0	5 P	41.0	5 A	60.5	62.5	54.5	13.8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	35.5	.231	91.0	N.E.	126	2.5	22	10 P	0 A	8 P	.35	
2	27.0	.278	54.5	W.N.W.	323	8.0	40	4 P				
3	31.5	.355	50.5	W.S.W.	278	5.5	33	4 P	11 P	12 P	T	
4	36.0	.329	65.5	N.N.W.	238	1.5	17	2 P	0 A	6 A	T	
5	43.0	.367	77.5	W.S.W.	103	1.0	14	1 P	6 A	1 P	.03	
6	54.0	.577	73.0	N.W.	259	5.5	33	3 P	6 A	7 A	T	
7	42.5	.422	65.5	E.S.E.	136	2.0	20	8 P	6 P	11 P	.07	
8	50.5	.504	73.0	W.N.W.	105	2.0	20	7 P				
9	47.0	.465	72.0	W.S.W.	141	1.5	17	1 P	8 P	12 P	T	
10	55.0	.554	83.5	W.S.W.	362	7.0	37	5 P	0 A	12 P	.02	
11	45.0	.441	69.5	N.N.E.	354	4.5	30	8 P	0 A	2 A	.02	
12	34.0	.483	40.5	N.	244	3.5	27	3 P				
13	41.5	.527	50.5	W.S.W.	141	1.5	17	7 P				
14	51.5	.587	69.5	N.N.W.	157	2.0	20	4 P	4 A	6 P	.10	
15	55.0	.672	63.5	N.N.W.	185	2.0	20	9 A				
16	48.0	.417	81.5	N.N.W.	106	1.0	14	5 P	1 A	12 P	.53	
17	49.5	.378	95.0	E.S.E.	92	0.0	—	—	0 A	12 P	.43	
18	50.5	.442	84.0	N.N.E.	77	0.5	10	1 P	0 A	10 P	.06	
19	51.5	.450	83.5	E.N.E.	72	1.5	17	4 P	10 A	5 P	.01	
20	49.0	.418	84.5	S.E.	121	0.5	10	2 A				
21	37.0	.354	62.0	E.S.E.	151	2.5	22	4 P				
22	39.5	.277	88.5	N.E.	219	4.5	30	1 P	0 A	12 P	.24	
23	35.5	.385	60.0	N.N.E.	245	3.0	24	6 A	0 A	10 A	.07	
24	48.0	.502	68.5	N.	195	5.5	33	3 P	4 P	9 P	.05	
25	41.0	.445	58.5	N.E.	173	5.5	33	8 A				
26	46.5	.472	69.0	W.N.W.	101	1.5	17	7 P				
27	54.0	.457	92.5	S.S.W.	95	0.0	—	—	10 A	12 P	.57	
28	56.0	.492	90.0	S.S.E.	62	0.0	—	—	0 A	12 P	.20	
29	52.0	.476	83.5	N.	151	4.5	30	6 P	0 A	1 P	.61	
30	45.0	.541	55.5	N.	195	6.0	35	1 P				
	45.5	.616	50.0	N.W.	164	4.0	28	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The season during May made less progress than usual, although abnormal features were not especially noticeable. Rains were frequent, although the total for the month was less than the normal. The month was slightly cooler than usual, without unusual temperatures.

Comparing the records with those of former years the principal features noted are as follows: The mean barometer was slightly below the normal, while the range was about the usual amount. The maximum temperature was about 5 degrees lower than usual, and the minimum more than 2 degrees higher than the normal, giving a comparatively small range. A few dates showed a large daily range.

The mean dew point was quite low, and the relative humidity a little greater than the normal.

The total precipitation was a little more than 10 per cent below the normal, and was well distributed throughout the month. No especially heavy rains were noted.

The tolal wind movement was about 20 per cent greater than usual, and the direction more variable than usual.

The sunshine record was slightly above the average, and but few cloudy days occurred. But one slight frost was observed during the month.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 246. JUNE, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.97, 8th, 9 A.
Minimum reduced to freezing,	29.29, 18th, 3 A.
Reduced† maximum reading,	30.26, 8th, 9 A.
Reduced† minimum reading,	29.58, 18th, 3 A.
Mean semi-daily reduced,	29.966
Monthly range,	0.68

****Air Temperature.*** In Degrees Fahr.

Highest,	91.5, 25th, 3 P.
Lowest,	40.0, 9th, 6 A.
Mean hourly,	66.4
Mean of means of max. and min.,	66.1
Mean sensible (wet bulb),	60.8
Monthly range,	51.5
Highest mean daily,	79.9, 25th
Lowest mean daily,	52.6, 9th
Mean maximum,	78.4
Mean minimum,	53.8
Mean daily range,	24.6
Greatest daily range,	35.5, 1st
Least daily range,	9.0, 5th

Humidity.

Mean dew point,	56.6
Mean force of vapor,	.668
Mean relative humidity,	73.6

Precipitation. In inches.

Total precipitation,	2.24
Number of days on which .01 inch or more rain or melted snow fell,	12

Wind.

Total movement,	4225m.
Greatest daily movement,	280m., 18th.
Least daily movement,	53m., 3d.
Mean daily movement,	141m.
Mean hourly velocity,	5.9 m.

Maximum pressure per square foot, 7.0 lbs.= 37 m. per hour, 18th, 4 P., WNW.

Maximum velocity for 5 minutes, 30m. per hour 18th, 4 P., WNW.

Prevailing Direction, West Northwest.

Summary.

West Northwest	20 per cent.
West	17 " "
Southwest	13 " "
Northeast	10 " "
Other directions,	40 " "

Weather.

Mean cloudiness observed,	44 per cent.
Total cloudiness recorded by the Sun Thermometer,	157 hrs.=34 per cent.
Number of clear days,	12
Number of fair days,	16
Number of cloudy days,	2

Bright Sunshine.

Number of hours recorded, 300 hrs.=66%

Rain, 2d, 4th, 5th, 6th, 9th, 10th, 11th, 13th, 14th, 15th, 17th, 18th, 22d, 24th, 28th.

Thunder and Lightning, 10th, 14th.

Gales, 35 miles or more per honr; 37m. 18th, W.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.05	29.84	29.984	79.0	. 4 P	43.5	5 A	61.3	62.2	54.5	13.9
2	30.07	29.90	29.979	73.0	3 P	43.0	4:30 A	58.0	58.8	53.5	7.5
3	29.92	29.79	29.862	86.5	4:30 P	53.0	5 A	69.7	68.3	60.7	11.4
4	29.98	29.82	29.912	75.0	3 P	54.0	4:30 A	64.5	65.3	56.7	9.3
5	29.82	29.75	29.785	61.0	0 A	52.0	12 P	56.5	56.7	55.3	0.0
6	30.04	29.82	29.957	74.0	2:30 P	52.0	4 A	63.0	60.0	53.7	12.4
7	30.13	30.01	30.078	74.0	3 P	50.5	4:30 A	62.3	62.4	53.5	8.3
8	30.26	30.13	30.233	73.0	5 P	47.0	5 A	60.0	59 4	49.3	13.0
9	30.25	30.15	30.216	65.0	10 A	40.0	6 A	52.5	52.6	52.7	6.5
10	30.15	29.94	30.025	61.5	12 M	51.0	1 A	56.3	56.5	56.0	0.0
11	29.94	29.85	29.908	76.0	5:30 P	55.0	4 A	65.5	62.2	58.5	8.7
12	29.97	29.89	29.932	79.0	3 P	51.0	5 A	65.0	66.1	60.0	11.3
13	30.00	29.83	29.943	79.0	1 P	50.0	5 A	64.5	64.0	61.0	9.3
14	29.91	29.78	29.854	82.5	2 P	61.0	0 A	71.7	71.1	67.3	9.6
15	30.17	29.90	30.072	75.0	4:30 P	55.0	12 P	65.0	65.6	58.3	11.6
16	30.25	30.09	30.179	76.5	3 P	45.0	5 A	60.7	63.0	55.7	12.5
17	30.11	29.64	29.910	76.0	1:30 P	52.0	4:30 A	64.0	62.9	57.7	9.3
18	30.03	29.58	29.887	66.5	9:30 A	46.0	12 P	56.3	56.9	49.7	9.3
19	30.11	30.01	30.067	72.0	4:30 P	43.0	4:30 A	57.5	59.4	53.7	13.0
20	30.15	30.03	30.089	83.0	2 P	55.0	2 A	69.0	69.7	62.7	9.7
21	30.06	29.95	30.015	85.0	3:30 P	64 0	5 A	74.5	75.0	65.7	10.5
22	29.99	29.85	29.932	90.5	3 P	60.0	5:30 A	75.3	76.6	74.5	12.2
23	29.85	29.75	29.791	89.0	4 P	69.0	4 A	79.0	77.2	72.3	12.3
24	29.80	29.73	29.774	89.0	3:30 P	66.0	4 A	77.5	76.9	72.5	8.3
25	29.82	29.76	29.789	91.5	3 P	66.0	4:30 A	78.7	79.9	75.7	12.3
26	30.05	29.82	29.960	86.0	1 P	64.0	12 P	75.0	76.7	70.5	13.4
27	30.11	30.02	30.063	84.0	4 P	58.0	5 A	71.0	72.5	68.5	10.5
28	30.02	29.82	29.875	85.0	5 P	63.0	5 A	74.0	73.7	70.5	7.4
29	30.02	29.82	29.957	82.0	4 P	57.0	12 P	69.5	71.0	59.7	12.8
30	30.07	29.80	29.942	81.0	5 P	48.0	5 A	64.5	68.1	63.0	13.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	46.0	.598	53.5	N.N.W.	107	2.0	20	1 P				
2	44.5	.475	77.5	S.W.	133	3.0	24	4 P	4 P		T	
3	57.0	.654	73.5	W.	53	0.0	—	—				
4	59.0	.643	78.5	E.N.E.	114	1.0	14	8 P	4 P	12 P	.02	
5	54.0	.448	95.5	N.E.	131	2.5	22	11 P	0 A	12 P	.40	
6	49.0	.519	67.5	N.E.	247	2.5	22	2 A	0 A	1 A	.05	
7	48.0	.555	57.5	N.E.	151	1.5	17	10 A				
8	38.5	.502	48.0	S.W.	133	1.0	14	7 P				
9	49.5	.457	80.5	W.S.W.	115	0.0	—	—	9 A	12 P	.03	
10	55.0	.468	94.0	E.S.E.	91	0.0	—	—	0 A	12 P	.55	
11	56.5	.543	85.0	W.	62	1.0	14	11 P	0 A	4 P	.01	
12	55.0	.657	66.0	W.	121	1.5	17	4 P				
13	59.0	.592	85.5	S.S.W.	153	3.0	24	3 P	4-30 P	8-30 P	.10	
14	65.5	.745	86.0	W.S.W.	172	2.0	20	1 P	8-30 P	12 P	.03	
15	54.0	.599	69.5	N.W.	143	2.0	20	11 A	0 A	0-30 A	.01	
16	49.5	.572	65.0	S.W.	122	1.5	17	5 P				
17	55.0	.531	83.5	S.S.W.	229	3.5	26	11 A	5 P	12 P	.60	
18	40.0	.442	67.5	W.N.W.	280	7.0	37	4 P	0 A	3 A	.41	
19	46.5	.541	61.5	W.N.W.	238	5.0	32	3 P				
20	58.5	.725	68.5	W.	193	3.5	26	2 P				
21	59.5	.903	57.5	W.N.W.	209	2.0	20	12 M				
22	73.0	.943	87.0	W.N.W.	141	2.0	20	2 P	8-30 P	9-30 P	T	
23	70.0	.923	80.0	N.N.W.	112	1.0	14	11 A				
24	71.5	.851	89.0	W.N.W.	89	1.0	14	1 P	6-30 P	7 A	T	
25	73.5	1.030	81.5	W.N.W.	110	1.5	17	2 P				
26	66.5	.966	68.5	N.W.	110	1.5	17	2 P				
27	65.5	.836	76.5	E.	66	0.0	—	—				
28	68.5	.850	83.0	S.W.	74	0.0	—	—	10 A	2 P	.03	
29	52.5	.742	53.0	N.N.E.	196	2.5	22	6 P				
30	58.5	.740	67.0	W.	130	2.0	20	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

During June most of the weather elements showed comparatively small departures from normal values for this month. The most marked features were a light precipitation and rather large wind movement. An examination of the daily temperature records shows some features not apparent from a comparison of the monthly means.

The mean barometer was practically normal and the fluctuations of pressure were slow and small. While the total wind movement was about 20 per cent more than the average, there were no especially large daily records and but a single gale was noted. The percentage of wind from the northwest quadrant was large.

The mean temperature was but slightly above the normal, and the maximum and minimum records were average values. During the first 20 days there were but two mean daily records higher than the mean temperature for the month, while the daily records for the last 10 days were all higher than the monthly mean.

The total precipitation was about 60 per cent of the normal amount and practically all of it occurred before the 19th. The last third of the month with its high temperature received no relief by showers in this vicinity.

The percentage of sunshine was high and but two cloudy days were noted.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 247. JULY, 1909.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.97, 21st, 6 A.
Minimum reduced to freezing,	29.10, 3d, 5A.
Reduced† maximum reading,	30.27, 21st, 6 A.
Reduced† minimum reading,	29.39, 3d, 5A.
Mean semi-daily reduced,	29.914
Monthly range,	0.88

****Air Temperature.*** In Degrees Fahr.

Highest,	93.0, 30th, 4 P.
Lowest,	42.0, 9th, 5 A.
Mean hourly,	68.7
Mean of means of max. and min.,	68.9
Mean sensible (wet bulb),	62.5
Monthly range,	51.0
Highest mean daily,	80.8, 30th
Lowest mean daily,	61.8, 4th
Mean maximum,	81.9
Mean minimum,	55.9
Mean daily range,	26.0
Greatest daily range,	40.0, 9th
Least daily range,	8.5, 23d

Humidity.

Mean dew point,	58.6
Mean force of vapor,	.708
Mean relative humidity,	71.8

Precipitation. In inches.

Total precipitation,	2.24
Number of days on which .01 inch or more rain or melted snow fell,	6

Wind.

Total movement,	5097m.
Greatest daily movement,	294m., 11th.
Least daily movement,	64m., 21st.
Mean daily movement,	164m.
Mean hourly velocity,	6.8 m.

Maximum pressure per square foot, 7.0 lbs.= 37 m. per hour, 18th, 6 P., N.

Maximum velocity for 5 minutes, 28m. per hour 8th, 5 P., N.

Prevailing Direction, West.

Summary.

Southwest	26 per cent.
West Northwest	16 " "
North Northwest	13 " "
Northwest	10 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	33 per cent.
Total cloudiness recorded by the Sun Thermometer,	172 hrs.=37 per cent.
Number of clear days,	4
Number of fair days,	24
Number of cloudy days,	3

Bright Sunshine.

Number of hours recorded, 290 hrs.=63%

Rain, 2d, 3d, 5th, 6th, 13th, 16th, 18th, 23d, 24th.

Thunder and Lightning, 16th, 23d.

Gales, 35 miles or more per hour; 35m. 3d, N.W.; 36m. 5th, N.; 37m. 8th, N.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.80	29.59	29.678	83.0	2:30 P	63.0	4 A	73.0	73.0	66.5	9.4
2	29.73	29.58	29.716	75.5	5 P	58.0	5:30 A	66.7	67.0	57.7	11.0
3	29.62	29.39	29.530	70.5	2 P	56.0	5 A	63.3	62.2	54.7	9.2
4	29.89	29.62	29.780	72.5	4 P	51.0	12 P	61.7	61.8	55.0	11.7
5	30.02	29.89	29.967	77.0	4 P	44 0	4 A	60.5	62.2	56.5	10.5
6	30.03	29.93	29.993	78.0	11 A	51.0	5 A	64.5	63.7	59.3	7.0
7	29.98	29.90	29.943	79.0	6 P	51 0	6 A	65.0	65.1	57.7	10.7
8	29.94	29.67	29.848	82.0	2 P	45 0	5:30 A	63.5	62.8	58.3	12.3
9	30.08	29.94	30.038	82.0	6 P	42.0	5 A	62.0	63.7	58.3	12.5
10	30.15	30.08	30.119	81.0	3 P	52.5	5:30 A	66.7	66.7	60.7	11.5
11	30.13	30.00	30.061	84.0	3 P	59.5	3 A	71.7	70.2	64.5	9.6
12	30.03	29.76	29.866	87.0	4 P	59.0	5:30 A	73.0	72.6	68.0	8.0
13	29.80	29.63	29.691	90.5	3 P	67.0	12 P	78.7	77.2	68.7	9.0
14	29.98	29.80	29.928	90.0	6 P	59 0	5 A	74.5	74.9	66.0	8.7
15	30.02	29.92	29.976	91.5	2 P	56.5	5:30 A	74.0	74.4	67.0	12.3
16	29.95	29.73	29.839	79 0	1 P	61.0	12 P	70.0	69.2	66.5	1.0
17	29.88	29.76	29.821	81.0	4 P	56.0	5:30 A	68.5	68.5	63.5	12.6
18	29.89	29.70	29.793	79.0	12 M	52.5	5:30 A	65.7	64.1	59.5	6.5
19	30.01	29.70	29.869	73.5	4 P	54.0	4 A	63.7	63.3	57.0	8.4
20	31.20	30.01	30.159	78.0	4:30 P	49.0	5:30 A	63.5	65.3	59.0	10.3
21	30.27	30.10	30.189	80.5	4 P	50.0	5 A	65.3	66.2	62.7	10.3
22	30.10	29.93	30.023	82.0	1:30 P	58.5	5 A	70.3	68.1	62.0	9 4
23	29.93	29.69	29.788	67.0	12 M	58.5	4:30 A	62.7	63.5	62.0	0.0
24	29.89	29.68	29.799	75.0	3:30 P	59.0	12 P	67.0	65.4	61.3	5.0
25	30.10	29.86	29.984	78.0	5 P	54.0	5 A	66.0	65.6	60.0	11.0
26	30.17	30.05	30.114	88.0	2 P	55.0	5 A	71.5	72.2	62.5	11.5
27	30.10	30.00	30.073	90.0	4 P	57.0	5:30 A	73.5	73.4	67.7	10.6
28	30.16	30.07	30.136	92.0	4 P	61.0	5 A	76.5	75.8	67.0	11.5
29	30.13	29.85	29.978	92.5	2 P	62.0	5 A	77.3	76.5	69.3	9.0
30	29.85	29.68	29.752	93.0	4 P	68.0	5 A	80.5	80.8	74.0	9.7
31	29.93	29.79	29.876	88.0	6 P	63.0	5 A	75.5	73.6	65.0	9.9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	63.0	.824	69.5	W.N.W.	193	2.0	20	2 P				
2	52.0	.640	60.5	N.N.W.	115	2.0	20	11 A	10 P	11 P	T	
3	52.0	.480	82.5	N.W.	245	6.0	35	1 P	3 A	7 A	.30	
4	48.5	.574	59.5	N.N.W.	183	4 0	28	12 M				
5	50.5	.603	60.5	N.W.	109	6.5	36	2 P	10 A	4 P	T	
6	56.5	.596	77.5	S.E.	85	3.0	24	1 P	11 A	4 P	.02	
7	52.5	.629	63.0	N.	149	2.5	22	5 P				
8	53.5	.598	70.5	N.N.W.	224	7.0	37	6 P				
9	52.5	.649	60.5	S.W.	98	0.5	10	9 A				
10	58.0	.623	78.5	S.W.	241	2.5	22	4 P				
11	61.5	.714	77.5	S.W.	294	1.5	17	1 A				
12	66.0	.774	84 5	S.W.	189	1.5	17	4 P				
13	65.0	.875	72.0	W.N.W.	239	1.5	17	1 P	8 A		T	
14	61.0	.902	59.0	N.W.	100	0.5	10	1 A				
15	63.5	.835	70.0	S.W.	153	1.5	17	5 P				
16	65.5	.713	89.0	S.W.	132	3.0	24	7 P	4 A	10 P	1.50	
17	59.0	.735	69.0	N.N.W.	163	2.0	20	10 A				
18	57.0	.593	80.0	W.S.W.	119	2.5	22	3 P	2 P	6 P	.04	
19	51.5	.583	67.0	N	207	3.0	24	11 A				
20	52.0	.695	56.5	N.N.E.	159	2.0	20	8 A				
21	59.0	.672	75.5	N.E.	64	0.0	—	—				
22	59.5	.630	82.5	S.S.W.	190	2.0	20	4 P				
23	60.5	.603	87.5	S.S.E.	188	2.0	20	11 A	9 A	12 P	.24	
24	58.5	.593	86.0	S.E.	128	2.5	22	1 P	0 A	10 A	.14	
25	55.5	.674	64.5	W.N.W.	212	3.0	24	10 A				
26	56.0	.808	55.5	W.N.W.	130	2.0	20	2 P				
27	65.0	.800	78.0	S.W.	151	1.5	17	8 P				
28	63.5	.819	72.0	S.W.	147	1.0	14	2 P				
29	66.0	.890	72.0	S.S.W.	240	2.0	20	4 P				
30	70.5	1.058	73.0	W.N.W.	169	2.0	20	3 P				
31	61.5	.749	73.0	N.N.E.	81	2.5	22	8 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was in general of midsummer type, although some of the features showed considerable departure from the mean values for July. The light precipitation and large wind movement were the most noticeable departures from the normals.

The mean barometer was unusually low, in fact during the past twenty years the July mean was materially lower in but two years. The maximum for the month was practically normal. The minimum was unusually low for the time of year, in fact, lower than any previous July record at this station, giving a range in pressure about twenty per cent. more than usual. A large percentage of the wind was from the western points of the compass, and the total movement was greater than any previous July record here. The amount was about fifty per cent. more than the average.

The mean temperature was more than two degrees below the normal, while the maximum and minimum were not far from average values.

The first third of the month was generally cool, and was followed by about a week with high temperature. From the 18th to the 26th the days were fair and pleasant, while the last six days were the most oppressive of the month.

The mean dew point and relative humidity were both slightly below the normal.

The precipitation was less than one-half the usual amount, and the smallest July record since 1894. About two-thirds of the total fell during a single storm on the 16th.

The sunshine record was large, and but three days were recorded as cloudy.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 248. AUGUST, 1909

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 10, 3d, 7 A.
Minimum reduced to freezing, 29.13, 18th, 3 P.
Reduced† maximum reading, 30.39, 3d, 7 A.
Reduced† minimum reading, 29.42, 18th, 3 P.
Mean semi-daily reduced, ... 30.023
Monthly range, ... 0.97

****Air Temperature.*** In Degrees Fahr.

Highest, ... 94.0, 8th, 4 P.
Lowest, ... 38.0, 31st, 5.30 A.
Mean hourly, ... 66.5
Mean of means of max. and min., ... 66.8
Mean sensible (wet bulb), ... 60.9
Monthly range, ... 56.0
Highest mean daily, ... 76.9, 8th
Lowest mean daily, ... 56.0, 31st
Mean maximum, ... 79.9
Mean minimum, ... 53.8
Mean daily range, ... 26.1
Greatest daily range, ... 38.0, 12th
Least daily range, ... 6.0, 17th

Humidity.

Mean dew point, ... 57.8
Mean force of vapor, ...636
Mean relative humidity, ... 78.1

Precipitation. In inches.

Total precipitation, ... 3.79
Number of days on which .01 inch or more rain or melted snow fell, ... 8

Wind.

Total movement, ... 3485m.
Greatest daily movement, ... 186m., 5th.
Least daily movement, ... 47m., 8th.
Mean daily movement, ... 112m.
Mean hourly velocity, ... 4.7 m.
Maximum pressure per square foot, 3.0 lbs.= 24 m. per hour, 15th, 1 P., W.S.W.
Maximum velocity for 5 minutes, 21m. per hour 10th, 8 A., N.
Prevailing Direction, West Northwest.

Summary.

West Northwest . . . . . 13 per cent.
North Northwest . . . . . 13 " "
North . . . . . 10 " "
East Southeast . . . . . 10 " "
Southeast . . . . . 10 " "
West Southwest . . . . . 10 " "
Other directions, ... 34 " "

Weather.

Mean cloudiness observed, ... 35 per cent.
Total cloudiness recorded by the Sun Thermometer, . . . 188 hrs.=44 per cent.
Number of clear days, ... 8
Number of fair days, ... 14
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . 241 hrs.=56%

Rain, 4th, 5th, 6th, 13th, 16th, 17th, 18th, 20th, 26th, 29th.

Thunder and Lightning, 20th.

Gales, 35 miles or more per hour; none

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.15	29.93	30.083	81.0	3 P	60.0	4 A	70.5	69 9	61 5	9.0
2	30.33	30.15	30 272	86.5	3:30 P	51.0	5 A	68.7	69 0	60.0	12 0
3	30.39	30.27	30.334	83.0	4 P	50.0	5 A	66.5	68 4	60.7	11.5
4	30.27	30.04	30.192	80.0	1:30 P	54.0	5 A	67.0	65 7	60.0	5.4
5	30.04	29.94	29.983	65.5	6 P	55.0	6 A	60 3	60.7	58.5	0 0
6	30.07	29 97	30.032	81 0	2 P	60 5	5 A	70.7	67 4	64.5	5 7
7	30.12	30.07	30.088	91.0	3:30 P	55.0	5 A	73.0	72.5	67.0	10 7
8	30.14	29.94	30.049	94.0	4 P	59 0	5:30 A	76 5	76.9	69.5	12.1
9	29.94	29 76	29.810	87.0	5:30 P	64 0	6 A	75.5	75.3	6 75	4.2
10	29.97	29 78	29.895	79.0	2 P	56.0	12 P	67.5	69 8	61.0	9 0
11	30.13	29 97	30.094	79.0	3:30 P	48.0	5:30 A	63.5	62 9	53.5	11.2
12	30.14	30.02	30.102	82.0	3 P	44.0	6 A	63 0	64 3	57 0	9 3
13	30.16	30.05	30.134	79.0	5 P	59.0	6 A	69 0	65 0	59.5	6.0
14	30.17	30.11	30.165	80.0	4 P	58.0	12 P	69.0	67 4	60.5	10 6
15	30.17	29 99	30 083	80.5	2 P	47.0	6 A	63 7	64.0	57.7	10.0
16	30.00	29.82	29.914	62.5	1 P	54.0	12 P	58 3	58.0	54 5	0.0
17	29.82	29 50	29.685	60 0	5 P	54 0	0 A	57.0	57 7	56.3	0 0
18	29.53	29 42	29 492	71.0	2 P	58 0	0 A	64.5	62.9	61.3	1.5
19	29 68	29.53	29.617	82.5	2:30 P	56.0	6 A	69.3	68.3	64.0	11 0
20	29.91	29.68	29.832	82.0	12 M	56 0	6 A	69 0	67.8	64.5	8 0
21	30.25	29 91	30.140	77.5	3 P	52 0	12 P	64 7	64.6	57.5	6.0
22	30 31	30.18	30.258	78.0	4:30 P	45 0	5 A	61 5	61.2	56.0	3.0
23	30.18	30.04	30.122	84 0	3:30 P	48.0	5:30 A	66.0	66.8	61.5	8 0
24	30.22	30.10	30.175	86 0	3:30 P	55 0	6 A	70.5	70.8	65.5	11.3
25	30.13	29.96	30.031	91.0	3 P	63 0	6 A	77.0	76.0	70.3	9 6
26	29.97	29.81	29.867	81.5	11½ A	61 5	5 A	71.5	73 3	69.5	5 5
27	30.02	29.85	29.945	81.5	5 P	55.0	12 P	68.3	68 0	59 7	12.1
28	30.06	29.94	30 008	83 5	4:30 P	48.0	6 A	65 7	65.2	60.3	11.0
29	30.01	29.80	29 907	82.0	12 M	58.0	12 P	70 0	68 0	64.5	4 0
30	30.24	30.01	30.208	71.5	3:30 P	46 0	12 P	58 7	58.9	54 0	11.4
31	30.29	30 03	30.186	73.5	2 P	38.0	5:30 A	55.7	56 0	51.3	11.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	55.5	.738	60.5	S.E.	81	0.0	—	—				
2	54.5	.691	61.5	N.E.	71	1.5	17	8 P				
3	55.5	.707	62.0	E.S.E.	85	0.5	10	9 P				
4	59.0	.545	92.0	E.S.E.	71	0.5	10	1 P	6 P	12 P	.20	
5	57.5	.517	93.0	N.N.E.	186	1.5	17	5 A	0 A	12 P	.70	
6	64.0	.635	93.5	W.N.W.	95	0.0	—	—	0 A	2 A	.02	
7	64.5	.770	79.0	W.N.W.	54	0.5	10	10 A				
8	67.5	.860	78.5	W.N.W.	47	0.0	—	—				
9	64.0	.825	76.5	S.W.	88	0.5	10	3 P				
10	56.5	.682	67.0	N.N.W.	171	2.5	22	4 P				
11	45.5	.553	53.5	N.	171	2.5	22	8 A				
12	53.0	.573	67.0	S.S.W.	80	1.0	14	7 P				
13	56.5	.581	81.0	S.	141	0.5	10	6 P	2 A	10 A	.27	
14	56.0	.636	73.0	S.W.	92	0.5	10	2 P				
15	54.0	.564	75.5	W.S.W.	165	3.0	24	1 P				
16	53.5	.443	94.0	S.E.	141	1.0	14	6 P	1 A	12 P	1.58	
17	55.5	.468	94 0	E.S.E.	171	1.5	17	10 A	0 A	11 P	.86	
18	59.5	.579	89.5	N.E.	139	1.0	14	10 A	3 P		T	
19	61.5	.678	82.0	N.N.W.	95	1.5	17	2 P				
20	61.5	.688	82.5	W.	98	2.0	20	1 P	12 M	8 P	.03	
21	54.0	.597	71.0	N.	134	1.5	17	5 P				
22	52.0	.536	73 5	N.	97	1.0	14	11 A				
23	59 5	.634	80 5	S.E.	80	0.0	—	—				
24	63.0	.730	80.0	S.	58	0.0	—	—				
25	68.0	.862	81.0	W.S.W.	137	2.0	20	3 P				
26	68.0	.810	84 0	W.S.W.	115	0.5	10	10 P	1 P		T	
27	51.0	.673	63 0	N.W.	184	2.0	20	1 P				
28	58.0	.591	82.0	N.N.W.	76	0 5	10	2 P				
29	63.5	.652	90.0	W.N W.	134	2.0	20	1 P	1 P	4 P	.13	
30	51.5	.475	80.0	N.N.W.	99	0.5	10	8 A				
31	48.0	.428	79.0	N.W.	129	1.5	17	5 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The month was generally pleasant and seasonable with fewer sultry days than usual. Abnormal features were wanting with the exception of a heavy rainstorm about the middle of the month.

Comparing the records with the twenty years' summary just published the following features are noted: The mean pressure was slightly higher than the average and the range large for August. The maximum was slightly higher and the minimum considerably lower than normal records. The wind movement was about ten per cent. above the normal and quite variable in direction.

The maximum temperature was over three degrees above the normal and the minimum nearly five degrees lower than usual giving a range of nearly eight degrees more than the August average. The maximum record is thus far the maximum for the year. The mean temperature was slightly below the normal. The low temperature on the morning of the 31st was very close to the frost line and while no frost was noted at the station, light frost was reported from some low lands in the vicinity.

The relative humidity was practically normal and the mean dew point about two degrees lower than usual.

The total precipitation was about ninety per cent of the normal and about two-thirds of it occurred during a single storm.

The amount of bright sunshine was slightly above the average; distant thunder was noted on a single date.

J. E. OSTRANDER, Meteorologist

R. C. LINDBLAD, Observer.

BULLETIN No. 249. SEPTEMBER, 1909

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 22, 19th, 8 A.
Minimum reduced to freezing, 29.43, 5th, 11 A.
Reduced† maximum reading, 30.52, 19th, 8 A.
Reduced† minimum reading, . 29.72, 5th, 11 A.
Mean semi-daily reduced, ... 30.114
Monthly range, ... 0.80

****Air Temperature.*** In Degrees Fahr.

Highest, ... 83.0, 14th, 3 P; 23rd 1:30 P.
Lowest, ... 35.0, 29th, 6 A.
Mean hourly, ... 60.5
Mean of means of max. and min., ... 60.7
Mean sensible (wet bulb), ... 55.4
Monthly range, ... 48.0
Highest mean daily, ... 72.7, 23rd
Lowest mean daily, ... 52.0, 20th
Mean maximum, ... 72.3
Mean minimum, ... 49.2
Mean daily range, ... 23.1
Greatest daily range, ... 38.0, 3rd; 29th
Least daily range, ... 7.0, 10th

Humidity.

Mean dew point, ... 52.6
Mean force of vapor, ...496
Mean relative humidity, ... 83.1

Precipitation. In inches.

Total precipitation, ... 4.99
Number of days on which .01 inch or more rain or melted snow fell, ... 14

Wind.

Total movement, ... 4008m.
Greatest daily movement, ... 276m., 5th.
Least daily movement, ... 35m., 22d.
Mean daily movement, ... 134m.
Mean hourly velocity, ... 5.6 m.
Maximum pressure per square foot, 5.5 lbs.= 33m. per hour, 5th, 2 P., N.N.W.
Maximum velocity for 5 minutes, 30m. per hour 4th, 12:30 P., S.W.
Prevailing Direction, Northwest.

Summary.

North Northeast . . . . . 17 per cent.
North Northwest . . . . . 13 " "
Southwest . . . . . 10 " "
West Northwest . . . . . 10 " "
Other directions, ... 50 " "

Weather.

Mean cloudiness observed, ... 55 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 182 hrs.=49 per cent.
Number of clear days, ... 9
Number of fair days, ... 9
Number of cloudy days, ... 12

Bright Sunshine.

Number of hours recorded, . . 192 hrs.=51%
Rain, 1st, 4th, 5th, 10th, 11th, 13th, 15th, 16th, 17th, 22d, 23d, 24th, 25th, 26th, 27th, 28th.
Thunder and Lightning, 1st.
Gales, 35 miles or more per honr; none

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.03	29.79	29.870	70.5	4 P	51.0	12 P	60.7	58.1	54.0	3.4
2	30.03	29.87	29.978	70.5	4 P	47.0	6 A	58.7	57.3	50.5	11.9
3	30.09	30.03	30.060	81.0	3:30 P	43.0	6 A	62.0	62.5	57.5	11.9
4	30.07	29.85	29.992	79.5	2 P	46.5	5 A	63.0	63 6	58 0	7.0
5	30.02	29.72	29.852	72.0	12 M	46.0	12 P	59.0	62.3	57.5	0.0
6	30.13	30.02	30.103	74.0	2:30 P	41.0	6 A	57.5	57.1	52.5	12.0
7	30.20	30.06	30.123	77.0	4 P	45.0	6 A	61.0	59.6	53.7	9.6
8	30.29	30.14	30.238	77.5	4:30 P	46.5	6 A	62.0	62.6	57.7	10.6
9	30.24	30.13	30.215	79.5	2 P	57.5	3 A	68.5	64 2	58.5	7.3
10	30.18	29.97	30.077	62.0	9 P	55.0	6 A	58.5	58.7	57.3	0.0
11	30.23	29.96	30.097	77.0	4 P	58.0	12 P	67.5	65.3	60.5	9.5
12	30.36	30.23	30.330	73.5	3 P	53.5	6 A	63.5	61.8	56.0	9.0
13	30.30	30.16	30.231	74.0	3.30 P	54.0	5 A	64.0	62.8	58.3	6.8
14	30.28	30.17	30.254	83.0	3 P	57.0	5:30 A	70.0	69.2	64.0	8.4
15	30.31	30.19	30.258	72.0	3 P	61.0	3 A	66.5	65.0	60.7	4.1
16	30.19	30.02	30 074	72.0	2:30 P	59.0	6 A	65 5	64.6	61.7	2.5
17	30.11	29.97	30.024	80.0	3:30 P	53.0	12 P	66.5	66.1	59 0	8.3
18	30.39	30.11	30.290	71.0	3 P	44.0	6 A	57.5	57.4	51.0	11.4
19	30.52	30.39	30.498	70.0	3:30 P	41.0	7:30 A	55.5	55 6	48.3	11.1
20	30.50	30.34	30.437	70.0	3:30 P	36.0	4:30 A	53.0	52.0	47.7	8.0
21	30.36	30.23	30.293	69.0	3:30 P	43.0	3:30 A	56 0	55 7	52.3	4.1
22	30.23	30.04	30.111	66.0	12 P	49.0	3 A	57.5	59 5	60.3	0.3
23	30.04	29.91	29.979	83.0	1:30 P	66 0	0 A	74 5	72.7	68.7	6.7
24	30.11	29.86	30 013	72.0	0 A	54.0	12 P	63 0	61.2	58.3	0.0
25	30.24	30.09	30.209	70.0	3:30 P	48.0	6 A	59.0	57.8	50.3	9.7
26	30.23	30.02	30,167	58.5	2:30 P	47.0	6:30 A	52.7	54.0	48.3	0.0
27	30.02	29.94	29.990	60.0	2:30 P	52.5	6 A	56.3	55.4	54.0	0.0
28	29.94	29.85	29.887	60.0	4 P	46.0	12 P	53.0	53.6	51.3	0.0
29	30.01	29.89	29.962	73.0	3:30 P	35.0	6 A	54.0	52 2	46.5	9.5
30	29.92	29.73	29.815	71.0	1:30 P	40.0	6:30 A	55.5	53.5	46.3	8.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	52.5	.448	88.0	N.N.W.	130	2.0	20	4 P	6 A	11 A	.08	
2	45.5	.446	69.5	N.N.W.	222	2.5	22	9 A				
3	54.0	.563	74.0	W.N.W.	89	1.0	14	3 P				
4	56.0	.542	84.5	S.W.	219	3.5	26	1 P	4 P	12 P	.02	
5	55.0	.521	86.5	N.N.W.	276	5.5	33	2 P	0 A	11 A	.20	
6	49.0	.463	75.5	W.N.W.	119	1.0	14	3 P				
7	50.0	.413	79.5	S.W.	101	0.0	—	—				
8	55.5	.539	83.5	S.W.	120	0.5	10	3 P				
9	56.0	.536	86.5	E.S.E.	106	2.5	22	4 P				
10	56.5	.495	91.5	E.S.E.	105	0.5	10	7 P	10 A	12 P	.50	
11	58.5	.589	85.5	N.	197	2.0	20	12 M	0 A	4 A	.08	
12	53.0	.513	78.5	S.E.	104	0.0	—	—				
13	56.0	.545	84 0	S.	120	0.0	—	—	8:30 P		T	
14	62.5	.665	85.0	S.S.E.	64	0.0	—	—				
15	58.5	.593	83.5	S.S.E.	116	0.5	10	12 M	6:30 A	8 A	T	
16	59.5	.607	86.0	S.	97	0.0	—	—	10 P	12 P	.13	
17	56.5	.552	85.0	W.N.W.	91	0.0	—	—	0 A	8 A	.50	
18	46.0	.446	71.0	N.N.E.	171	2.0	20	11 A				
19	43.5	.402	70.5	S.E.	105	0.0	—	—				
20	45.0	.361	85.0	E.	46	0.0	—	—				
21	50.0	.435	87.0	N.W.	38	0.0	—	—				
22	54.0	.548	94.0	N.N.W.	35	0.0	—	—	6 A	12 P	.02	
23	69.0	.781	89 5	S.S.W.	228	2.0	20	12 M	0 A	9 P	.02	
24	56.5	.530	87.5	N.N.E.	201	2.0	20	11 A	1 A	12 P	.59	
25	45.5	.432	72.0	N.N.E.	172	2.5	22	10 A	0 A	2 A	.02	
26	44.0	.402	72.0	N.N.E.	198	1.5	17	8 A	6 P	12 P	.08	
27	53.0	.427	95.5	N.N.E.	162	2.0	20	12 P	0 A	12 P	1.43	
28	49.5	.396	90.5	N.	194	2.0	20	5 P	0 A	7 P	1.32	
29	44.5	.344	88.5	W.S.W.	39	0.0	—	—				
30	44.0	.343	83.0	W.S.W.	143	1.5	17	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The most prominent features of the weather during September were the large precipitation, comparatively small range of temperature and the absence of frost. While very light frost was observed in this vicinity on the morning of the 29th there was none at the station. Not since 1891 has the first frost of the season occurred as late as October.

An analysis of the previous records here shows the following features: The mean barometer was the highest since 1894, and the maximum and minimum records were both considerably higher than the normal, while the range was less than usual. The total wind movement was over 20 per cent. more than the normal, and the direction quite variable.

The maximum temperature was about 5 degrees lower than the September normal and the minimum record was rather high, giving a range of more than 7 degrees less than usual. The mean temperature was slightly less than normal.

The mean dew point was slightly above the average and the relative humidity about 5 per cent. greater than the normal.

The total precipitation was about ¾ of an inch more than the average. Considerably more than one half the total fell in a single storm near the close of the month.

The amount of sunshine was very nearly normal, although the last third of the month was quite cloudy.

Notwithstanding the rather large wind movement there were no gales registered.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 250. OCTOBER, 1909

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 21, 20th, 8 A.
Minimum reduced to freezing, 29.25, 15th, 2 P.
Reduced† maximum reading, 30.52, 20th, 8 A.
Reduced† minimum reading, 29.55, 15th, 2 P.
Mean semi-daily reduced, ... 30.035
Monthly range, ... 0.97

****Air Temperature.*** In Degrees Fahr.

Highest, ... 85.0, 10th, 3 P.
Lowest, ... 24.0, 21st, 7 A.
Mean hourly, ... 47.7
Mean of means of max. and min., ... 48.7
Mean sensible (wet bulb), ... 42.4
Monthly range, ... 61.0
Highest mean daily, ... 61.5, 10th
Lowest mean daily, ... 33.8, 29th
Mean maximum, ... 60.6
Mean minimum, ... 36.7
Mean daily range, ... 23.9
Greatest daily range, ... 42.0, 7th
Least daily range, ... 5.5, 24th

Humidity.

Mean dew point, ... 38.0
Mean force of vapor, ...317
Mean relative humidity, ... 76.1

Precipitation. In inches.

Total precipitation, ... 1.23
Number of days on which .01 inch or more rain or melted snow fell, ... 9

Wind.

Total movement, ... 4400m.
Greatest daily movement, ... 343m., 29th.
Least daily movement, ... 26m., 8th.
Mean daily movement, ... 142m.
Mean hourly velocity, ... 5.9 m.
Maximum pressure per square foot, 8.5 lbs.= 41m. per hour, 17th, 11 A., N.W.
Maximum velocity for 5 minutes, 27m. per hour 17th, 12 M., N.W.
Prevailing Direction, West Northwest.

Summary.

North . . . . . 13 per cent.
North Northwest . . . . . 10 " "
Northwest . . . . . 16 " "
West Northwest . . . . . 19 " "
Other directions, ... 42 " "

Weather.

Mean cloudiness observed, ... 49 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 147 hrs.=43 per cent.
Number of clear days, ... 10
Number of fair days, ... 11
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . 194 hrs.=57%

Rain, 3d, 11th, 12th, 14th, 15th, 16th, 17th, 18th, 21st, 23d, 24th, 28th.

Thunder and Lightning, 21st, 23d.

Frosts, 13th, 14th, 16th, 17th, 18th, 19th, 20th, 21st, 26th, 30th,

Gales, 35 miles or more per honr; 41m. 17th, N.W.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.84	29.78	29.817	59.0	2:30 P	42.0	4 A	50.5	51.7	47.7	3.3
2	29.86	29.77	29.817	61.5	3 P	48.0	6:30 A	54.7	52.4	46.3	6.9
3	30.15	29.86	30.052	61.0	4:30 P	44.0	5:30 A	52.5	52.6	49 5	1.9
4	30.33	30.15	30.279	61.0	2.30 P	44.0	6 A	52.5	50.5	46.5	4.3
5	30.38	30.28	30.337	73.0	4 P	35.0	6:30 A	54.0	51.0	44.0	9.2
6	30.29	30.12	30.213	75.0	2:30 P	37.5	6 A	56.3	52 6	45.0	8.5
7	30.13	30.02	30.107	80.0	3:30 P	38.0	6:30 A	59.0	56.5	50.7	10.0
8	30.26	30.13	30.237	79.0	3 P	44.5	6 A	61.7	59.1	52.0	9.8
9	30.32	30.23	30.294	84.5	4:30 P	43.0	6:30 A	63.7	59.5	53.0	9 0
10	30.28	30.07	30,178	85.0	3 P	43.5	6:30 A	64.3	61.5	53.5	9.8
11	30.07	29.77	29.921	70.5	1 P	42.0	7 A	56 3	55.9	50.5	7.2
12	29 77	29.56	29.662	71.5	1:30 P	46.0	12 P	58.7	56.5	54.5	5.3
13	29.90	29.76	29.868	57.0	3 P	31.0	6:30 A	44.0	43.8	35.3	8.3
14	29.92	29.65	29.824	56.0	2 P	30.0	6:30 A	43.0	45 6	39 7	7.3
15	29 71	29.55	29.650	56.5	2:30 P	36.0	12 P	46.3	47.4	43 3	1.5
16	29.95	29.71	29.821	52.5	2:30 P	32.5	3:30 A	42.5	41.5	38.0	3.5
17	30.24	29.95	30.125	53.5	12 M	37.5	1:30 A	45.5	43 6	39.5	3.5
18	30.29	30.21	30.271	50.0	12 M	32.0	4 A	41.0	41.6	39 0	0.8
19	30.50	30.25	30.426	52.0	3 P	28.5	5:30 A	40.3	39.7	34.5	6.7
20	30.52	30.34	30.452	58.5	3:30 P	25.0	6:30 A	41.7	39.5	34.5	9.8
21	30.37	29.93	30 198	51.5	3:30 P	24.0	7 A	37.7	41.0	39.0	4.0
22	29.93	29.81	29.883	58.5	0:30 P	44.5	6:30 A	51.5	51.5	47 0	2.0
23	29 92	29 87	29.916	55.0	12 M	43.0	12 P	49 0	48 5	43 0	5.4
24	29 97	29.81	29.902	45.5	5 P	40.0	9 A	42.7	42.5	39 5	0.0
25	29.96	29.89	29.936	53.5	1:30 P	32.0	11 P	42.7	42.0	36.3	9.1
26	29.98	29.85	29.934	61.5	3 P	31.0	3 A	46.3	44.5	38 7	9.1
27	29.90	29.72	29.850	65.0	1 P	38.0	6:30 A	51.5	50 0	42.5	7.5
28	30.00	29.84	29.933	45.5	0:30 P	35.5	7 A	40.5	40 5	35.3	4.4
29	30.00	29.92	29.990	41.0	2 P	30.0	5 A	35.5	33 8	28.0	8.5
30	30.12	30.03	30.085	51.0	2 P	26.5	4 A	38.7	36.8	28.5	9.9
31	30.15	30.02	30.104	55.0	3:30 P	33.5	0:30 A	44.3	44 4	39.3	7.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	42.5	.389	69.0	W.N.W.	182	2.0	20	3 P				
2	42.5	.356	77.0	W.N.W.	202	2.5	22	11 A				
3	45.5	.406	77.0	N.W.	83	0.5	10	9 A	11 A	4 P	.02	
4	44.0	.344	85.0	N.N.E.	67	0.0	—	—				
5	42.5	.308	91.5	N.	52	0.0	—	—				
6	42.5	.329	87.0	W.N.W.	67	0.5	10	4 P				
7	49.0	.410	86.0	S.	40	0.0	—	—				
8	50.0	.423	86.0	S.	26	0.0	—	—				
9	52.0	.437	91.0	S.S.W.	36	0.0	—	—				
10	49.5	.483	76.0	S.S.W.	38	0.0	—	—				
11	49.5	.405	86.0	E.S.E.	92	1.0	14	4 P	11 P	12 P	.07	
12	51.0	.478	81.0	S.S.E.	194	2.5	22	3 P	0 A	8:30 A	.54	
13	27.0	.257	61.5	N.W.	147	1.5	17	4 P				
14	33.5	.298	68.5	S.W.	250	3.5	26	11 A	9 P	12 P	.01	
15	39.0	.316	76.5	N.N.W.	150	1.5	17	6 P	0 A	10 A	.07	
16	33 5	.256	76.0	N.W.	152	5.0	32	2 P	11 A	6 P	.01	
17	34.5	.280	70.0	W.N.W.	314	8.5	41	11 A	12 M	1 P	T	T
18	35.5	.262	80.5	W.N.W.	125	1.0	14	10 A	1 P	6 P	T	
19	29.5	.223	74.0	N.	145	2.5	22	12 M				
20	30.5	.220	77.5	E.S.E.	52	0.0	—	—				
21	36.5	.268	86.5	S.W.	112	2.0	20	8 P	12 M	11 P	.24	
22	43.5	.360	80.0	N.W.	168	1.5	17	1 P				
23	39.0	.315	75.5	N.W.	182	1.0	14	1 P	3:30 P	12	.16	
24	36.0	.264	82.5	N.N.E.	219	3.5	26	8 P	0 A	11	.11	
25	31.5	.240	75.0	N.	286	4.0	28	2 M				
26	34.0	.275	73.0	W.	105	0.0	—	—				
27	38.5	.313	77.5	W.N.W.	141	2.0	20	2 P				
28	29 0	.240	66.5	N.N.W.	198	5.0	32	1 P	3 P	2 P	T	T
29	17.5	.185	54.0	N.N.W.	343	4.0	28	2 P				
30	15.0	.188	47.0	N.	183	3.0	24	11 A				
	32.5	.285	66.0	W.S.W.	49	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during October was marked by a large number of pleasant days and more than an average amount of sunshine. The small precipitation and late appearance of the first frost were also noticeable features.

A comparison of the records with those of former years shows the following features : — The mean barometer was nearly normal, the minimum pressure was rather high, giving the lowest October range for ten years. The total wind movement was about ten per cent. more than the mean, and an unusual amount was from the Northwest quadrant.

The mean temperature shows that the month was slightly cooler than usual. This feature was not noticeable on account of the general character of the days, alluded to above. The maximum and minimum temperatures were both high and the range was more than five degrees greater than usual. The first frost at the station occurred on the 13th — the latest date on our records. The only other year on our records when the first frost occurred in October is 1891, when the first frost was on the 12th.

The precipitation during the month was only one third the normal and occurred in small amounts on several dates.

The mean dew-point was lower and the relative humidity higher than the October normals.

The amount of cloudiness was smaller than usual, and the number of cloudy days correspondingly few. But one gale was recorded during the month.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 251. NOVEMBER, 1909

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 43, 7th, 9 A.
Minimum reduced to freezing, 29.20, 17th, 1 P.
Reduced† maximum reading, 30.74, 7th, 9 A. 10th, 8 A.
Reduced† minimum reading, 29.50, 17th, 1 P.
Mean semi-daily reduced, ... 30.160
Monthly range, ... 1.24

****Air Temperature.*** In Degrees Fahr.

Highest, ... 72.0, 12th, 3:30 P.
Lowest, ... 18.5, 10th, 7 A.
Mean hourly, ... 41.3
Mean of means of max. and min., ... 42.0
Mean sensible (wet bulb), ... 37.1
Monthly range, ... 53.5
Highest mean daily, ... 54.2, 13th
Lowest mean daily, ... 28.2, 30th
Mean maximum, ... 52.1
Mean minimum, ... 31.9
Mean daily range, ... 20.2
Greatest daily range, ... 39.0, 12th
Least daily range, ... 8.5, 24th, 25th

Humidity.

Mean dew point, ... 32.6
Mean force of vapor, ...258
Mean relative humidity, ... 77.2

Precipitation. In inches.

Total precipitation, ... 1.06
Number of days on which .01 inch or more rain or melted snow fell, ... 8
Total snow in inches 2.5

Wind.

Total movement, ... 5793m.
Greatest daily movement, ... 426m., 24th.
Least daily movement, ... 19m., 28th.
Mean daily movement, ... 193m.
Mean hourly velocity, ... 8.0 m.
Maximum pressure per square foot, 13.0 lbs.= 51m. per hour, 29th, 11 A., N.E.
Maximum velocity for 5 minutes, 36m. per hour 29th, 11 A., N.E.
Prevailing Direction, West Northwest.

Summary.

Northeast . . . . . 13 per cent.
South Southwest . . . . . 13 " "
West Southwest . . . . . 13 " "
West Northwest . . . . . 10 " "
North Northwest . . . . . 10 " "
Other directions, ... 41 " "

Weather.

Mean cloudiness observed, ... 56 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 147 hrs.=50 per cent.
Number of clear days, ... 8
Number of fair days, ... 11
Number of cloudy days, ... 11

Bright Sunshine.

Number of hours recorded, . . 146 hrs.=50%

Rain, 2d, 3d, 5th, 8th, 14th, 15th, 16th, 17th, 22d, 23d, 24th, 25th, 29th.

Snow, 5th, 16th, 19th, 23d, 24th, 25th.

Thunder and Lightning, 2d.

Hail, 23d, 24th.

Gales, 35 miles or more per hour; 39m. 9th, N.N.E.; 37m, 23d, N.E.; 40m, 24th, E.N.E.; 40m, 26th, N.E.; 51m, 29th, N.E.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.29	30.15	30.235	61.5	3:30 P	34.5	7:30 A	48.0	45.7	39.0	7.5
2	30.18	29.86	29.975	62.0	4 P	38.5	0 A	50.3	50.2	51.0	0.2
3	29.87	29.70	29.770	55.0	3 P	41.5	8 P	48.3	50.8	45.5	1.8
4	29.81	29.60	29.715	55.0	2 P	34.0	12 P	44.5	43.6	38.5	8.3
5	30.22	29.81	30.080	45.0	12 M	31.0	12 P	38.0	37.4	33.7	3.9
6	30.58	30.22	30.407	54.0	2:30 P	29.0	2 A	41.5	39.2	34.0	9.3
7	30.74	30.58	30.704	50.0	3 P	21.0	7:30 A	35.5	33 7	29 5	9.5
8	30.62	30.30	30.400	51.0	4 P	30.5	0:30 A	40.7	43.4	42.7	0.0
9	30.72	30.40	30 670	51.0	3 P	26.0	12 P	38.5	39.4	32.3	9.3
10	30.74	30.53	30.642	48.0	3 P	18.5	7 A	33.3	33.5	30.3	8.9
11	30.53	30.29	30,380	65.0	3 P	34.0	6 A	49.5	47.3	41.5	7 6
12	30.29	30.13	30.228	72 0	3:30 P	33.0	7:30 A	52.5	50.4	44 0	8.2
13	30.59	30.27	30.502	62.0	2 P	46.5	12 P	54.3	54.2	50.0	5.1
14	30.63	30.44	30.566	59.0	2:30 P	43.5	1:30 A	51.3	49.8	47.0	4.7
15	30.44	30.15	30.242	62.5	3 P	47.5	12 P	55 0	52.5	49.0	3.2
16	30.31	30 02	30 202	47.5	1:30 P	35.0	6:30 A	41.3	43 1	37.7	5.0
17	30.02	29.50	29.664	56.0	0:30 P	36.5	12 P	46.3	44.0	39.3	0.7
18	30.15	29.67	29.980	36.5	0 A	23.0	12 P	29.7	30.5	24.5	5.5
19	30.21	30.11	30.182	37.0	1 P	21.0	2:30 A	29.0	30.0	27.7	0.5
20	30.11	29.86	29.975	57.5	1 P	33 0	0 A	45.3	44.2	38.3	5.6
21	30.04	29.83	29.933	66.0	1 P	38.0	6 A	52.0	53.0	44.5	5.0
22	30.14	29 64	29.939	53.0	0 A	42.0	9:30 A	47.5	46.0	41.7	0.0
23	30.03	29.52	29.727	57.0	8 A	28.5	11 P	42.7	42.8	41.5	0.1
24	30.10	29.72	29 966	37.0	11 A	28.5	0 A	32.7	30.9	30 0	0.0
25	29.74	29.57	29.636	38.5	12 M	30.0	0 A	34.3	34.8	35.0	0.0
26	30.28	29.74	30.079	43.5	3 P	31.0	3 A	37.3	35 0	30.7	6.2
27	30.42	30.28	30.408	50.0	3 P	27.0	12 P	38.5	34.9	29.5	8.3
28	30.37	30.03	30.228	50.5	2 P	23.5	7:30 A	37.0	33.9	29.0	7.3
29	30.19	29.99	30.134	43.0	1 P	27.0	12 P	35.0	35.8	29.5	5.8
30	30.25	30.16	30.236	36.5	2 P	23.5	12 P	30.0	28.2	23.3	8.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	36.0	.260	82.0	W.S.W.	25	0.0	—	—				
2	50.0	.402	92.5	W.S.W.	121	1.5	17	7 P	5 A	12 P	.15	
3	42.0	.339	82.5	N.N.W.	110	0.0	—	—	0 A	1 P	.02	
4	34.0	.258	78.0	N.N.W.	133	2.0	20	2 P				
5	28.0	.219	71.0	W.N.W.	217	4.0	28	1 P	5 A		T	T
6	26.5	.231	64.0	N.W.	162	3.0	24	3 P				
7	23.0	.187	69.5	W.	82	0.0	—	—				
8	41.0	.291	90.5	S.W.	183	3.5	26	10 A	12 M	6 P	.01	
9	27.0	.206	72.5	N.N.E.	212	7.5	39	3 A				
10	28.5	.190	84.5	S.	93	0.5	10	12 M				
11	38.5	.290	83 0	S.S.W.	75	0.0	—	—				
12	42.5	.327	90.0	S.S.W.	35	0 0	—	—				
13	48.0	.393	85.5	E.S.E.	91	0.0	—	—				
14	45.0	.340	89.5	S.S.W.	70	0.0	—	—	11 P	12 P	T	
15	45.5	.396	81.5	W.S.W.	168	2.5	22	8 P	0 A	10 A	T	
16	31.0	.268	65.0	N.	183	4.0	28	3 A	6 P	12 P	T	T
17	34.0	.271	75.0	N.W.	159	3.5	26	2 P	0 A	8 P	.44	
18	13.5	.161	52.0	N.N.W.	400	5.5	33	2 P				
19	23.5	.164	79.0	S.W.	188	0.5	10	12 M	1 P	10 P		T
20	32.5	.275	68.0	W.S.W.	257	3.5	26	1 P				
21	38.0	.381	61.5	W.N.W.	255	4.5	30	12 M				
22	39.0	.287	83.0	S.S.W.	152	2.0	20	1 A	8 A	12 P	T	
23	36.5	.321	73.5	W.N.W.	370	7.0	37	4 P	0 A	12 P	.02	T
24	28.0	.172	92.0	N.N.E.	426	8.0	40	12 M	0 A	12 P	.06	1.0
25	34.5	.206	98.0	N.E.	302	4.0	28	3 A	0 A	12 P	.18	1.5
26	24.5	.195	69.0	N.E.	359	8.0	40	4 P				
27	25.0	.181	75.0	N.E.	214	3.0	24	3 A				
28	26.5	.175	87.0	E.N.E.	19	0.0	—	—				
29	19.0	.200	56.5	N.E.	336	13.0	51	11 A	2 A	7 A	.18	
30	16.0	.142	65.0	E.N.E.	396	5.5	33	3 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during November was abnormal in several of its elements, resulting in a month more pleasant than usual for the time of year. The small precipitation and comparatively high average temperature were perhaps the most noticeable features and the ones having the greatest effect.

An analysis of the several elements shows the following features of more or less interest: The mean barometer was the highest November record since 1895; the maximum and minimum were both unusually high while the range of pressure was nearly normal. Several well marked high and low points were recorded with rather rapid changes of pressure between. The total wind movement was about one-fourth more than the average as would be expected from the barometric activity.

The mean temperature as deduced from the mean of the maximum and minimum daily records was more than four degrees higher than the normal, and the maximum and minimum for the month were both several degrees above the usual records. The month was the warmest since 1902.

The mean dew point and relative humidity were both slightly higher than normal records.

The total precipitation was the same as for November, 1908, the amount being only one-third the normal. These two records are the smallest for this month since this station was established.

The last third of the month showed a number of days with large wind movement, and a considerable number of gales were recorded.

The amount of bright sunshine was about 20 per cent more than the mean.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 252. DECEMBER, 1909

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.26, 12th, 12 P.
Minimum reduced to freezing,	28.72, 26th, 6 A.
Reduced† maximum reading,	30.58, 12th, 12 P.
Reduced† minimum reading,	29.04, 26th, 6 A.
Mean semi-daily reduced,	29.888
Monthly range,	1.54

****Air Temperature.*** In Degrees Fahr.

Highest,	51.5, 5th, 3 P.
Lowest,	—8.5, 30th, 8 A.
Mean hourly,	24.7
Mean of means of max. and min.,	25.5
Mean sensible (wet bulb),	21.0
Monthly range,	60.0
Highest mean daily,	39.3, 14th
Lowest mean daily,	2.6, 30th
Mean maximum,	33.1
Mean minimum,	17.8
Mean daily range,	15.3
Greatest daily range,	28.0, 31st
Least daily range,	4.5, 26th

Humidity.

Mean dew point,	15.8
Mean force of vapor,	.131
Mean relative humidity,	75.2

Precipitation. In inches.

Total precipitation,	2.95
Number of days on which .01 inch or more rain or melted snow fell,	5
Total snow in inches	12

Wind.

Total movement,	5845m.
Greatest daily movement,	507m., 26th.
Least daily movement,	37m., 28th.
Mean daily movement,	189m.
Mean hourly velocity,	7.9 m.

Maximum pressure per square foot, 14.0 lbs.= 53m. per hour, 26th, 7 A., N.N.E.

Maximum velocity for 5 minutes, 33m. per hour 13th, 10 P., S.E.

Prevailing Direction, North.

Summary.

North Northeast	26 per cent
North Northwest	19 " "
West Northwest	16 " "
North	13 " "
Northwest	10 " "
Northeast	10 " "
Other directions,	6 " "

Weather.

Mean cloudiness observed,	45 per cent.
Total cloudiness recorded by the Sun Thermometer,	135 hrs.=48 per cent.
Number of clear days,	8
Number of fair days,	16
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, . . 148 hrs.=52%

Rain, 7th, 13th, 14th.

Snow, 8th, 13th, 16th, 22d, 25th, 26th.

Hail, 7th, 13th.

Days Sleighing, 6.

Gales, 35 miles or more per hour; 42m. 13th, S.E.; 37m. 14th, S. S. E.; 53m. 26th, N.N.E.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.18	29.73	30.043	41.0	2 P	18.5	7 A	29.7	28.5	23.7	8.4
2	29.94	29.90	29.954	38.0	1 P	29 0	6 A	33.5	32.0	26.5	4.6
3	29.99	29.89	29.938	38.0	3 P	28.0	12 P	33.0	33.0	29.3	1.7
4	29.95	29.85	29.918	43.0	2 P	25.0	6:30 A	34.0	32.0	29.7	3.7
5	30.06	29.95	30.020	51.5	3 P	28.0	12 P	39.7	37.2	29.5	8.3
6	30.08	29.96	30.034	49.5	2 P	25.5	6 A	37.5	33.7	28.3	7.9
7	30.10	29.54	29.870	35.0	2 P	19.5	7 A	27.3	28.6	26.7	1.7
8	29.79	29.54	29.736	36.0	6 A	23.5	10 P	29.7	30.5	26.3	2.9
9	29.88	29.79	29.868	30.0	3 P	19.0	8 A	24.5	23.3	18.0	6.3
10	30.11	29.87	29.982	32.5	2 P	21.0	6 A	26.7	25.8	22.3	3.3
11	30.41	30.11	30.306	35.5	3 P	18.0	12 P	26.7	25.7	21.5	8.2
12	30.58	30.41	30.508	30.0	3 P	13.0	7:30 A	21.5	19.3	14.5	6.7
13	30.58	29.79	30.254	36.0	12 P	18 0	0 A	27.0	26.6	27.0	0.0
14	29.79	29.48	29 667	45 0	3:30 A	34 0	11 P	39.5	39.3	35.7	5.3
15	29.73	29.66	29.706	40.0	12 M	30 0	12 P	35 0	33.0	29 3	1.0
16	29.79	29.65	29 700	36.0	2 P	26 0	7:30 A	31.0	30 5	26.7	5.3
17	29.91	29.71	29.838	36.0	1 P	24.5	7 A	30.3	28.7	25.3	5.9
18	29.82	29.71	29.764	30.0	2 P	19.5	10 P	24 7	25.5	21.0	0.7
19	29.89	29.78	29.840	31.0	3 P	17.0	11 P	24.0	23.8	19.5	4.5
20	29.99	29.89	29.974	30.5	2 P	14.5	12 P	22.5	21.0	16.5	7.6
21	30.00	29.91	29.966	30.0	2 P	13.0	3 A	21.5	20.7	17.5	4.7
22	29.91	29.64	29.726	27.5	2 P	17.0	7:30 A	22.3	22.0	18.5	4.4
23	29.98	29.64	29.903	35.5	12 M	23.0	0 A	29.3	28.0	25.0	5.5
24	30.11	29.97	30 055	36.0	2 P	16.0	12 P	26 0	26.1	21.7	6.5
25	30.10	29 35	29.783	22.0	12 P	10.0	7:30 A	16.0	17.1	15 5	0.3
26	29.39	29.04	29.198	26.0	6 A	21.5	0 A	23 7	24.7	24.0	0.0
27	29.59	29.39	29.558	29.0	2 P	14.5	12 P	21.7	21 0	16.0	7.6
28	29.71	29.59	29.668	27.0	3 P	1.5	7:30 A	14.3	11.8	7.3	5.9
29	29.71	29.59	29.662	14.5	4 P	−4.0	7 A	5 3	4.9	4 0	3.7
30	30.01	29.67	29.873	11.0	3 P	−8.5	8 A	1.3	2.6	1.7	8.1
31	30.29	30 01	30.213	25.5	2 P	−2.5	0 A	11.5	8.7	3.5	7.1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	17.0	.146	66.0	N.E.	273	5.0	32	1 P				
2	16.0	.170	56.5	N.E.	298	4.0	28	1 A				
3	24.0	.183	70.5	N.N.E.	51	0.0	—	—				
4	26.0	.174	84.5	N.N.E.	144	2.5	22	12 M				
5	20.5	.188	59.5	N.N.E.	169	1.0	14	4 A				
6	24.5	.168	80.0	N.	99	1.0	14	3 P				
7	24.5	.154	89.0	N.N.E.	46	0.0	—	—	2 P	11 P	.36	
8	19.5	.162	69.0	N.N.W.	254	4.0	28	10 A	7 A	9 A		T
9	7.5	.116	55.5	N.W.	255	2.0	20	8 A				
10	15.5	.136	66.5	N.N.W.	273	4.5	30	11 A				
11	16.0	.128	74.0	N.N.E.	171	1.5	17	10 A				
12	5.5	.096	60.5	N.E.	188	1.5	17	9 A				
13	25.0	.172	89.5	E.	104	9 0	42	11 P	5 A	2 P	1.15	4.0
14	30 5	.238	72.5	N.W.	279	7.0	37	2 A	0 A	5 A	.42	
15	24.0	.182	70.5	W.N.W.	157	1.0	14	12 M				
16	21.5	.160	73.0	N.N.W.	138	0.5	10	10 A	10 P			T
17	21.5	.147	79.5	W.N.W.	187	1.5	17	11 P				
18	13.5	.128	65.0	W.N.W.	255	3.0	24	12 M				
19	12.5	.120	67.0	W.N.W.	262	2.0	20	1 P				
20	10.5	.103	70.5	N.	106	0.0	—	—				
21	12.5	.106	75.5	N.W.	146	1.0	14	3 P				
22	15.0	.110	78.5	W.N.W.	250	4.0	28	3 P	8 P	9 P		T
23	20.0	.148	75.0	N.N.W.	339	3.5	26	3 P				
24	19.0	.127	84.5	N.	222	4.5	28	11 A				
25	14.0	.094	93.0	N.N.E.	71	3.0	24	12 P	4 P	12 P	.03	2.0
26	21.5	.136	85.0	N.N.E.	507	14.0	53	7 A	0 A	9 P	.99	6.0
27	11.0	.055	73.0	N.N.W.	225	2.5	22	2 A				
28	5.5	.065	91.0	N.N.W.	37	0.0	—	—				
29	2.0	.058	90.5	N.N.E.	44	0.5	10	10 P				
30	-3.0	.044	93.0	N.	203	4.0	28	4 P				
31	-2.0	.056	74.5	S.S.W.	92	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1909.

Pressure. In inches.

Maximum reduced to freezing, ... 30.42, Jan. 8, 8 A.; 16th, 7 P.
Minimum reduced to freezing, ... 28.54. Mar. 25th, 10 P.
Maximum reduced to freezing and sea-level, ... 30.75, Jan. 8, 8 A.; 16th. 7 P.
Minimum reduced to freezing and sea-level, ... 28.84, Mar. 25th, 10 P.
Mean reduced to freezing and sea-level, ... 30.006
Annual range, ... 1.91

****Air Temperature.*** In degrees Fahr.

Highest, ... 94.0, Aug 8th, 4 P.
Lowest, ... —8.5, Dec. 30, 8 A.
Mean, ... 46.8
Mean of means of max. and min., ... 47.3
Mean sensible (wet bulb), ... 42.3
Annual range, ... 102.5
Highest mean daily, ... 80.8, July 30.
Lowest mean daily, ... 2.6, Dec. 30.
Mean maximum, ... 58.0
Mean minimum, ... 36.6
Mean daily range, ... 21.4
Greatest daily range, ... 42.0, Oct. 7.
Least daily range, ... 3.5, Feb. 24.

Humidity.

Mean dew point, ... 38.2
Mean force of vapor, ...369
Mean relative humidity, ... 76.8

Wind.

Prevailing direction, ... Northwest

Summary.

North, Northwest, ... 15 per cent.
Northwest, ... 10 " "
West, Southeast, ... 10 " "
North, ... 10 " "
West, Northwest, ... 12 " "
Other directions, ... 43 " "
Total movement, ... 63.513 m.
Greatest daily movement, ... 705 m., Apr. 8.
Least daily movement, ... 19 m., Nov. 28.
Mean daily movement, ... 174 m.
Mean hourly velocity, ... 7.2 m.

Maximum pressure per square foot, 27.5 lbs.=74 m. per hour, Apr. 8, 10 A., N.N.W.
Maximum velocity for 5 minutes, 45 m. per hour, Mar. 25, 2 P. S.E.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 39.12
Number of days on which .01 or more rain or melted snow fell, ... 128
Snow total in inches, ... 31

Weather.

Mean cloudiness observed, ... 50 per cent.
Total cloudiness recorded by Sun Thermometer, ... 1944 hrs.=44 per cent.
Number of clear days, ... 112
Number of fair days, ... 151
Number of cloudy days, ... 102

Bright Sunshine.

Number of hours recorded, 2510 hrs.=56 per cent.

Dates of Frosts.

Last, ... May 12th
First, ... Oct. 13th

Dates of Snow.

Last, ... April 29th
First, ... Oct. 17th
Total days of sleighing, ... 39

Gales of 50 or More Miles Per Hour.

Feb. 6th, 54 m., S.; Mar. 25th, 60m., S.E.
April 7th, 51 m., N.N.W.; 8th, 74 m., N.N.W.; 12th, 52 m., W.; 19th, 60 m., W.S.W.
Nov. 29th, 51 m.; N.
Dec. 29th, 53 m., N.N.E.

*Temperature in ground shelter.

C. M. DAMON,
Observer.

J. E. OSTRANDER,
Meteorologist.

BULLETIN No. 253. JANUARY, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 53, 4th, 11 P.
Minimum reduced to freezing.	28.80, 29th, 5 P.
Reduced† maximum reading,	30.87, 4th, 11 P.
Reduced† minimum reading,	29.11, 29th, 5 P.
Mean semi-daily reduced,	30.114
Monthly range,	1.76

****Air Temperature.*** In Degrees Fahr.

Highest,	56.0, 22d, 3:30 A.
Lowest,	—9.0, 5th, 5:30 A.
Mean hourly,	25.5
Mean of means of max. and min.,	26.2
Mean sensible (wet bulb),	22.3
Monthly range,	65.0
Highest mean daily,	42.6, 22d
Lowest mean daily,	0.0, 5th
Mean maximum,	35.4
Mean minimum,	17.1
Mean daily range,	18.3
Greatest daily range,	40.5, 1st
Least daily range,	2.5, 25th

Humidity.

Mean dew point,	18.2
Mean force of vapor,	.142
Mean relative humidity,	80.9

Precipitation. In inches.

Total precipitation,	6.14
Number of days on which .01 inch or more rain or melted snow fell,	13
Total snow in inches	19.5

Wind.

Total movement,	5786m.
Greatest daily movement,	430m., 4th.
Least daily movement,	28m., 17th.
Mean daily movement,	187m.
Mean hourly velocity,	7.8 m.

Maximum pressure per square foot, 15.0 lbs.= 55m. per hour, 3d, 11 P., N.N.W.

Maximum velocity for 5 minutes, 40m. per hour 4th, 2 A., N.N.W.

Prevailing Direction, North Northwest.

Summary.

Northeast	16 per cent.
North	13 " "
North Northeast	13 " "
West Southwest	13 " "
West	10 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	60 per cent.
Total cloudiness recorded by the Sun Thermometer,	175 hrs.=60 per cent.
Number of clear days,	5
Number of fair days,	12
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, 119 hrs.=40%

Rain, 6th, 7th, 18th, 21st, 22d, 25th, 26th, 29th.

Snow, 3d, 5th, 7th, 14th, 15th, 18th, 27th, 28th, 29th, 30th.

Days Sleighing, 25.

Gales, 35 miles or more per hour; 55m. 3d, N.N.W.; 51m, 4th, N.N.W.; 135m, 7th, N.; 46m, 10th, N.E.; 36m, 14th, N.E.; 44m, 15th, N.E.; 36m, 18th, W.; 39m, 21st, S.S.W.; 40m, 22d, W.S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.32	29.88	30.174	33.5	12 P	-7.0	8 A	13.3	13.1	12.0	4.3
2	29.97	29.73	29.870	44.0	11 A	30.0	12 P	37.0	37.5	33.5	1.1
3	30.00	29.85	29.907	33.0	4 P	23.0	12 P	28.0	29.1	27.0	0.3
4	30.87	30.00	30.643	23.0	0 A	-7.0	12 P	8.0	3.7	-1.3	8.0
5	30.86	30.25	30.618	14.0	12 P	-9.0	5:30 A	2.5	0.0	-1.0	0.0
6	30.25	29.86	29.884	36.0	2:30 P	14.0	0 A	25.0	30.0	31.3	0.0
7	30.38	29.66	29.973	34.5	9 A	20.0	12 P	27.3	29.0	27.7	0.1
8	30.66	30.38	30.650	29.0	2 P	12.0	8 A	20.5	19.6	14.0	7.8
9	30.58	30.25	30.363	35.0	3:30 P	14.0	7:30 A	24.5	20.1	13.7	6.2
10	30.60	30.24	30.478	29.0	3 P	13.0	12 P	21.0	22.1	18.3	7.4
11	30.63	30.53	30.610	30.0	4 P	7.5	4 A	18.7	16.9	12.0	7.0
12	30.60	30.50	30.577	27.0	4,30 P	7.5	7 A	17.3	15.0	12.7	0.3
13	30.65	30.53	30.601	31.0	3 P	6.0	7:30 A	18.7	17.7	13.5	5.8
14	30.57	30.27	30.453	25.0	12 M	12.0	12 P	18.5	18.0	15.0	0.0
15	30.37	30.22	30.313	30.0	3 P	17.0	8 A	23.5	21.0	16.5	4.7
16	30.42	30.30	30.363	40.5	3:30 P	4.5	6:30 A	22.5	17.9	9.3	8.8
17	50.36	30.15	30.289	36.0	3 P	-4.0	8 A	16.0	14.3	9.0	7.8
18	30.15	29.59	29.741	43.0	6 P	19 0	2 A	31.0	34.8	38.0	0.0
19	30.12	29.63	29.969	43.0	1:30 A	29.0	12 P	36.0	35.5	28.5	5.8
20	30.29	30.12	30.213	42.5	3 P	20.0	7 A	31.3	32.0	28.0	7.1
21	30.15	29.54	29.868	51.0	12 P	26.5	5 A	38.3	37.8	36.5	1.3
22	29.65	29.42	29.563	56.0	3:30 A	34.0	12 P	45.0	42.6	36.5	0.3
23	30.13	29.65	30.020	40.5	2:30 P	30.0	12 P	35.3	33.6	28.7	7.7
24	30.17	30.09	30.134	39.0	3 P	23.5	7 A	31.3	31.1	28.3	4.1
25	30.09	29.91	29.993	34.5	8 A	32.0	5 A	33.3	33.5	33 5	0.0
26	29.95	29.72	29.851	41.5	3;30 P	27.5	8 A	34.5	32.3	28.5	8.5
27	29.72	29.33	29.420	37.0	8:30 P	29.5	3 A	33.3	32.1	30.7	0.2
28	29.73	29.42	29.677	36.5	2 A	28.5	12 P	32.5	32.7	30.5	5.8
29	29.67	29.11	29.344	35.5	12 M	27.0	8 P	31.3	31.0	28.7	0.0
30	30.02	29.52	29.937	34.5	3 P	24.0	7 A	29.3	29 2	26.0	6.0
31	30.04	29.98	30.025	32.5	2:30 P	25.5	7 A	29.0	28.6	26.0	3.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	11.0	.106	95.0	W.S.W.	132	3.5	26	8 P				
2	29 5	.211	77.0	N.W.	405	5.0	32	12 M				
3	22.0	.162	73.0	N.W.	140	15.0	55	11 P	10 A	3 P		T
4	−12.0	.046	57.0	N.N.E.	430	13.0	51	2 A				
5	−5.5	.045	80.5	E.N.E	122	3.0	24	2 A	10 A	12 P	.20	1.5
6	30.5	.176	97.5	S.S.E.	42	1.0	14	10 P	0 A	12 P	*	
7	26.0	.159	91.0	N.	173	6.0	35	3 P	0 A	12 M	1 29	T
8	9.0	.092	76.0	W.N.W.	71	0.0	—	—				
9	8.5	.090	75.5	S.	58	0.0	—	—				
10	13.5	.108	77.5	N.N.E.	290	10.5	46	3 P				
11	8.5	.081	82.0	N.E.	75	0.0	—	—				
12	4.7	.081	70.5	N.	32	0.0	—	—				
13	10.7	.092	86.5	N.E.	74	1.0	14	10 P				
14	12.0	.093	85.5	N.E.	265	6.5	36	1 P	2 A	12 P	*	*
15	4 5	.109	55.0	E.N.E.	289	9 5	44	6 A	0 A	4 A	.96	13.0
16	−1.5	.076	57.0	N.E.	161	2.5	22	7 A				
17	7.7	.078	93.0	W.	28	0 0	—	—				
18	34 0	.232	79.5	W.S.W.	222	6.5	36	1 P	0 A	9 P	.46	1.5
19	25 5	.194	75.5	N.	292	5.5	33	4 P				
20	23.5	.170	81.0	W.	116	0.0	—	—				
21	35.5	.238	93 0	S.S.W.	216	7.5	39	4 P	11 A	12 P	1 20	
22	31.0	.255	70.5	W.S.W.	425	8.0	40	3 A	0 A	5 P	.90	
23	22.0	.179	69.5	W.S.W.	391	2.5	22	2 A				
24	26.0	.164	87.5	W.	69	0.5	10	11 A				
25	31.5	.197	92.5	N.N.E.	105	0.5	10	9 P	4 A	6 P	.20	
26	26.5	.160	94.5	N.N.E.	141	1.0	14	8 A	8 P	10 P	T	
27	28.0	.182	85.5	S.W.	93	0.0	—	—	0 A	4 P	.18	1.2
28	29.5	.171	97.5	N.N.W.	280	5.0	32	5 A	9 P	12 P	.10	1.0
29	27.0	.162	92.0	N.E.	174	2.5	22	7 P	0 A	9 P	.51	0.5
30	22.0	.153	77.5	N.N.W.	337	5.5	33	11 A	7:30 A	12 P	.14	0.8
31	23.0	.151	83.5	N.	138	1.0	14	11 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month presented extreme records in a number of features, but perhaps the most prominent was the range in the records of some of the elements, especially those of temperature and pressure. The amount of precipitation was also exceptionally large.

An analysis of the several weather elements of the month shows the following features: The mean barometer was the highest in ten years, excepting only the years 1907 and 1909. The maximum was extremely high and the minimum quite low giving the greatest range since 1894. The fluctuations in pressure were generally large and rapid giving a pressure chart of large waves. As usual, high winds marked the periods of greatest fluctuations of pressure.

The mean temperature was more than two degrees above the normal; the maximum over five degrees higher than usual and occurred during a heavy rain at 3-30 A. M.—a most unusual time for such a record. The minimum was slightly lower than usual, giving the large range referred to above.

The mean dew point and relative humidity were both high as might be inferred from the precipitation and sunshine records.

The total precipitation was about eighty per cent more than the normal and well distributed throughout the month. The record was the largest since 1898.

The wind movement was large with a considerable number of gales and more than usual from the northeast quadrant.

The amount of sunshine was less than the average, giving a large number of cloudy days.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 254. FEBRUARY, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.46, 26th, 8 A.
Minimum reduced to freezing,	29.09, 12th, 1 P.
Reduced† maximum reading,	30.80, 26th, 8 A.
Reduced† minimum reading,	29.40, 12th, 1 P.
Mean semi-daily reduced,	30.069
Monthly range,	1.40

****Air Temperature.*** In Degrees Fahr.

Highest,	53.5, 21st, 3 P.
Lowest,	—7.0, 26th, 7 A.
Mean hourly,	23.9
Mean of means of max. and min.,	23.6
Mean sensible (wet bulb),	20.8
Monthly range,	60.5
Highest mean daily,	44.0, 28th
Lowest mean daily,	2.2, 7th
Mean maximum,	33.3
Mean minimum,	13.9
Mean daily range,	19.4
Greatest daily range,	40.5, 26th
Least daily range,	9.0, 28th

Humidity.

Mean dew point,	16.9
Mean force of vapor,	.134
Mean relative humidity,	81.3

Precipitation. In inches.

Total precipitation,	5.08
Number of days on which .01 inch or more rain or melted snow fell,	13
Total snow in inches	18.5

Wind.

Total movement,	5834m.
Greatest daily movement,	376m., 1st.
Least daily movement,	57m., 3d.
Mean daily movement,	208m.
Mean hourly velocity,	8.7 m.

Maximum pressure per square foot, 15.0 lbs.= 55m. per hour, 23d, 11 A., W.N.W.

Maximum velocity for 5 minutes, 33m. per hour 5th, 3 P., W.N.W.

Prevailing Direction, Northwest.

Summary.

Northwest	18 per cent.
North Northeast	14 " "
South Southwest	14 " "
North	11 " "
West Northwest	11 " "
Other directions,	32 " "

Weather.

Mean cloudiness observed,	57 per cent.
Total cloudiness recorded by the Sun Thermometer,	116 hrs.=39 per cent.
Number of clear days,	11
Number of fair days,	11
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 180 hrs.=61%

Rain, 9th, 17th, 18th, 20th, 27th, 28th.

Hail, 17th, 18th.

Snow, 3d, 4th, 9th, 11th, 12th, 17th, 18th, 20th, 22d, 23d.

Days Sleighing, 28.

Gales, 35 miles or more per hour; 41m. 1st, N.E.; 42m, 4th, N.N.E.; 48m, 5th, N.W; 45m, 10th, N.W.: 55m, 23d, W.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.07	29.97	30.047	31.5	3 P	18.0	7 A	24.7	24.4	19.3	8.4
2	30.15	30.06	30.129	35.0	3 P	14.5	6 A	24.7	23.3	20.7	6.7
3	30.09	29.62	29.818	36.0	8:30 P	21.0	0 A	28.5	28.9	30.0	0.0
4	29.71	29.54	29.675	37.0	3 P	18.5	10:30 P	27.7	29.0	25.0	8.1
5	29.82	29.61	29.710	28.0	11 A	16.5	10 P	22.3	23.0	19.5	6.3
6	30.06	29.79	29.916	17.5	0 A	-5.0	12 P	6.3	8.0	2.5	9.2
7	30.30	30.06	30.240	11.0	4 P	-6.0	8 A	2.5	2.2	-1.5	9.4
8	30.27	30.06	30.171	37.0	3 P	7.0	6 A	22.0	24.0	18.3	7.8
9	30.06	29.63	29.890	39.0	12 M	26.5	6:30 A	32.7	33.3	29 7	5.4
10	30.34	29.63	30.066	38.0	4 P	18.0	12 P	28.0	28.1	21.5	9.3
11	30.67	30.34	30.592	21.5	8 P	8.5	7:30 A	15.0	17.4	14.5	7.3
12	30.37	29.40	29.634	29.5	2 P	16 0	0 A	22.7	23.4	21.5	0.9
13	29.95	29.64	29.856	26.5	3 P	12.5	6 A	19.5	20.0	18.0	7.6
14	30.10	29.95	30 064	33.0	4 P	15.0	2 A	24.0	23.1	19.7	7.7
15	30.09	30.00	30.040	39.0	4 P	20.0	0 A	29.5	31.1	27 7	5.1
16	30.05	29.84	29.946	52.0	1 P	34.0	12 P	43.0	40.1	34.0	6.0
17	30.18	29.60	30.052	34.0	0 A	19.0	12 M	26.5	22.8	20.5	0.0
18	30.33	29.52	29.968	24.5	4 P	8.5	12 P	16.5	18.7	14.7	10.0
19	50.56	30.33	30.028	26.0	4:30 P	-1.0	7 A	12.5	13.9	12.0	9.9
20	30.61	30.26	30.489	36.0	3 P	3.5	7:30 A	19.7	23.0	20.3	9.0
21	30.26	29.77	29.882	53.5	3 P	31.0	0 A	42.3	39.8	35.7	5 3
22	29.98	29.78	29.710	38.0	0 A	20.0	12 P	29 0	30.8	30.7	0.0
23	30.43	29.95	30.166	26.0	10 A	10.5	12 P	18 3	19.0	16.7	7.5
24	30.55	30.43	30.016	27.0	3 P	1.5	7 A	14.3	12.2	8.0	8.9
25	30.68	30.47	30.571	26.0	4:30 P	-4.5	7 A	10.7	9.0	5.0	10.2
26	30.80	30.49	30.684	33.5	4 P	-7.0	7 A	13.3	15.1	14.5	9.2
27	30.49	30.13	30.244	47.0	3 P	33.5	0 A	40.3	41.8	40.5	3.1
28	30.12	30.03	30.069	48.0	11:30 A	39.0	12 P	43.5	44.0	43.3	1.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	12.0	.119	66.5	N.N.E.	376	8.5	41	4 P				
2	16.5	.122	81.5	N.E.	65	0.0	—	—				
3	30.0	.170	100.0	N.E.	57	2.5	22	11 P	5 A	12 P	.18	1.0
4	23.0	.143	88.0	N.N.E.	359	9.0	42	9 A	0 A	3 A	.04	T
5	16.0	.115	82.5	N.W.	281	11.5	48	3 P				
6	1.0	.055	89.5	N.N.W.	334	3.0	24	2 P				
7	−4.0	.036	87.5	N.W.	302	0.5	10	9 A				
8	11.0	.123	67.5	S.S.W.	161	2.5	22	5 P				
9	27.0	.173	89.0	S.S.W.	205	1.0	14	3 P	3:30 P	9 P	.51	1.0
10	13.5	.133	63.0	N.W.	367	10.0	45	7 A				
11	5.0	.100	59.0	N.	176	0.5	10	12 M	8 P	12 P	.16	*
12	18.5	.122	84.0	N.N.W.	219	4.5	30	7 P	0 A	4 P	.94	8.0
13	13.5	.108	76.0	W.N.W.	322	5.5	33	3 P				
14	15.5	.118	80.0	W.N.W.	219	2.5	22	5 P				
15	23.5	.171	78.0	N.W.	99	0.0	—	—				
16	27.5	.228	67.5	W.	206	1.0	14	3 P	6 P	12 P	.01	
17	19.5	.114	96.5	N.N.E.	181	1.0	14	7 A	0 A	12 P	*	*
18	8.0	.096	68.0	N.	309	3.0	24	3 P	0 A	3 A	1.52	4.0
19	7.0	.084	74.5	W.S.W.	107	0.5	10	3 P				
20	19.5	.123	97.5	S.S.W.	164	1.5	17	5 P	8 P	12 P	T	T
21	32.5	.235	80.0	S.W.	105	0.5	10	8 P	0 A	10 A	.68	
22	28.5	.180	88.0	N.N.E.	79	3.5	26	11 P	8 A	9 P	.47	4.0
23	10.5	.103	70.0	W.N.W.	262	15.0	55	11 A	9 A	10 A	.01	0.5
24	4.5	.068	83.5	N.W.	88	0 0	—	—				
25	−1.5	.061	72.0	N.	151	2.5	22	1 P				
26	14.0	.108	97.5	S.	131	2.5	22	2 P				
27	39.0	.265	90.5	S.	360	4.5	30	9 A	12 M	12 P	.01	
28	43.0	.282	98.0	S.S.W.	149	2.5	22	2 A	0 A	12 P	.55	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

During the month of February good winter weather in general prevailed. Most of the records of the several elements show unimportant departures from the normals. The most noticeable feature was the large precipitation.

Comparing the records for the month with the normals at this station the following characteristics appear: The mean barometer was slightly above the normal, and the maximum and minimum were both high. The range was considerably less than the average. The changes in pressure were not rapid or especially large, except in a few instances.

The mean temperature was slightly above the normal, and the range about the usual amount. The maximum and minimum temperatures were both between two and three degrees higher than the February normal values. Three different periods of zero weather were noted, but the duration of each was comparatively short.

The mean dew point was practically normal, while the relative humidity was rather high.

The total precipitation was about 60 per cent. more than usual, and was well distributed throughout the month. The snowfall was large, and as it did not melt rapidly there was sleighing throughout the month.

The total wind movement was more than a thousand miles above the normal. While there were several dates with a large daily movement the number of gales was small.

The amount of sunshine was large, and the observed cloudiness much greater in the morning than in the evening.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 255. MARCH, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 19, 19th, 8 A.
Minimum reduced to freezing,	29.08, 14th, 4 A.
Reduced† maximum reading,	30.50, 19th, 8 A.
Reduced† minimum reading,	29.39, 14th, 4 A.
Mean semi-daily reduced,	30.076
Monthly range,	1.11

****Air Temperature.*** In Degrees Fahr.

Highest,	78.0, 29th, 3:30 P.
Lowest,	12.5, 18th, 6:30 A.
Mean hourly,	39.1
Mean of means of max. and min.,	40.2
Mean sensible (wet bulb),	34.1
Monthly range,	65.5
Highest mean daily,	57.8, 25th
Lowest mean daily,	26.9, 18th
Mean maximum,	51.5
Mean minimum,	28.8
Mean daily range,	22.7
Greatest daily range,	42.0, 29th
Least daily range,	6.5, 1st

Humidity.

Mean dew point,	28.8
Mean force of vapor,	.234
Mean relative humidity,	72.8

Precipitation. In inches.

Total precipitation,	1.37
Number of days on which .01 inch or more rain or melted snow fell,	8
Total snow in inches	trace

Wind.

Total movement,	5579m.
Greatest daily movement,	349m., 28th
Least daily movement,	64m., 2d.
Mean daily movement,	180m.
Mean hourly velocity,	7.5 m.

Maximum pressure per square foot, 11.5 lbs.= 48m. per hour, 25th, 2 P., W.S.W.

Maximum velocity for 5 minutes, 36m. per hour 25th, 2P., W.S.W.

Prevailing Direction, West Northwest.

Summary.

Northwest	13 per cent.
North Northwest	13 " "
West Northwest	10 " "
South Southwest	10 " "
South	10 " "
Other directions,	44 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	96 hrs.=26 per cent.
Number of clear days,	19
Number of fair days,	9
Number of cloudy days,	3

Bright Sunshine.

Number of hours recorded, . . 275 hrs.=74%

Rain, 1st,2d,6th, 7th, 13th, 14th, 20th, 31st.

Snow, 7th, 13th, 14th.

Hail, 13th, 14th.

Thunder and Lightning, 7th.

Days Sleighing, none.

Gales, 35 miles or more per hour; 36m. 14th, N.N.W.; 48m, 25th. W.S.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.21	30.11	30.192	39.5	5 A	33.0	12 P	36.3	36.5	35.0	0.0
2	30.15	30.01	30.070	38.5	5 P	28.0	12 P	33.3	33.7	33.0	2.5
3	30.10	30.01	30.070	46.0	4 P	25.0	7 A	35.5	35.2	32.0	10.2
4	30.23	30.10	30.215	47.0	3 P	27.5	7 A	37.3	35.8	31.5	10.6
5	30.26	30.09	30.204	53.0	3:30 P	24.5	7 A	38.7	38.0	33 7	9.0
6	30.18	29.74	30.024	54.5	3 P	28.0	7 A	41.3	41.0	36.3	8.2
7	29.74	29.50	29.570	47.0	5 A	30.0	12 P	38.5	39 6	38.0	7.3
8	29.91	29 66	29.807	38.0	4 P	26.5	6 A	32 3	31.5	28.5	8.3
9	30.16	29.91	30.038	43 0	2 P	27 0	6 A	35.0	32.8	27.3	9.9
10	30.30	30.16	30 244	40.0	4 P	20.0	6:30 A	30.0	28.2	25.5	11.0
11	30 30	30.20	30 270	44.0	4 P	17.0	6 A	30.5	29 5	24.7	10.5
12	30.30	29.95	30.162	44.0	3 P	23.5	6:30 A	33 7	33.1	28 7	11.0
13	29.95	29.42	29.604	56 5	3:30 P	27 0	7 A	41.7	39.5	32.7	10 3
14	29.82	29.39	29.622	36.0	0 A	23 0	12 P	29 5	29 4	24.0	8.0
15	30.01	29.82	29 960	40 0	3:30 P	20 5	1:30 A	30.3	28.5	25 0	8.8
16	30.00	29.79	29.890	47.0	4:30 P	17.5	6:30 A	32.3	32.7	28.5	10.3
17	30.22	29.87	30 061	37.5	3:30 P	20 0	12 P	28.7	28.7	24 0	6.3
18	30.47	30.22	30 418	41.0	5 P	12.5	6:30 A	26.7	26.9	23 7	11.4
19	30.50	30.02	30.404	52.5	3 P	27.0	5 A	39.7	38.1	34.0	7.8
20	30.06	29 87	29.886	60.5	3 P	36 0	0 A	48.3	45.9	42.5	6.7
21	30.29	30 06	30.245	53.0	4 P	29.5	4:30 A	41.3	39.6	33 0	11.6
22	30.19	29.85	29.988	59 0	4 P	31.5	6 A	45.3	43.3	37.7	6 6
23	30.32	30.01	30.228	62 0	4 P	33.5	6:30 A	47.7	45 8	37.0	11.0
24	30.33	29 94	30.126	58.0	4 P	31.0	6 A	44 5	45.0	41 0	11.1
25	29 94	29 68	29.851	76.5	2 P	44 5	1 A	60.5	57 8	48.7	10.7
26	30.19	29 91	30 060	53.0	3 P	36.5	6:30 A	44.7	44.3	37 7	9.0
27	30.37	30.19	30.294	62.0	4:30 P	37.0	3 A	49.5	46 9	37.0	11.7
28	30.37	30 04	30.186	57.0	3 P	35 0	6 A	46.0	45.3	40 7	11.0
29	30.15	30.04	30.130	78.0	3:30 P	36 0	4 A	57.0	57.5	51 0	11.3
30	30.37	30 13	30.244	75.0	1:30 P	43 0	3 A	59 0	55.0	43.5	8.5
31	30.39	30.17	30.280	58.0	3 P	42.5	6 A	50.3	48.5	41.5	4.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	33.5	.212	91.0	N.N.E.	100	0.5	10	1 P	0 A	12 P	.46	
2	32 0	.191	95.0	N.E.	64	0.0	—	—	0 A	8 P	.02	
3	26.0	.208	68.5	S. W.	102	2.0	20	4 P				
4	24.0	.194	76.5	W.N.W.	103	0.0	—	—				
5	28.5	.218	79.5	S.S.W.	119	1.5	17	2 P				
6	33.5	.244	79.5	S.S.E.	82	0.0	—	—	8 P	12 P	.60	
7	35.0	.260	79.5	W.N.W.	299	4.5	30	2 P	0 A	7 A	.16	T
8	24.0	.172	74.0	W.N.W.	320	5.5	33	1 P				
9	19.0	.172	61.5	N.W.	165	2.0	20	6 P				
10	18.5	.155	69 5	N.N.W.	97	0.0	—	—				
11	19.5	.150	72.0	W.S.W.	74	0.0	—	—				
12	23.0	.175	74.5	E.N.E.	143	1.5	17	2 P				
13	25.5	.220	65.0	N.N.W.	185	1.5	17	8 P	10 P	12 P	.02	T
14	19.5	.141	77.0	N.W.	324	6.5	36	10 A	0 A	2 A	.03	T
15	20.5	.148	77.0	N.	153	0.0	—	—				
16	22.5	.179	72.0	N.N.W.	100	0.5	10	6 P				
17	18.5	.145	71.0	N.N.E.	168	1.0	14	5 P				
18	18 0	.142	74 5	N.W.	101	0.0	—	—				
19	30.5	.215	80.5	S.	289	3.5	26	2 P				
20	40 5	.295	85.0	S.W.	256	2.0	20	10 A	11 A	7 P	.07	
21	24.0	.230	55.5	W.	191	4.5	30	8 A				
22	31.0	.274	65.0	S.	279	2 0	20	10 A				
23	29.0	.273	58.5	E.	142	1.0	14	9 A				
24	38.0	.285	80.5	S.	244	2.0	20	12 M				
25	44.5	.411	71 5	W.	325	11.5	48	2 P				
26	31 0	.268	65.0	N.N.W.	238	2.5	22	11 A				
27	26 5	.283	52.0	E.N.E.	108	1.5	17	12 M				
28	37.5	.282	80.5	S.S.W.	349	4.5	30	11 A				
29	45.0	.476	63 5	N.W.	173	2.5	22	2 P				
30	36.5	.357	62.0	E.	101	1.5	17	3 P				
31	38.0	.292	79.0	S.S.E.	185	1.5	17	2 P	6 P	9 P	.01	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

During the month the weather was exceptionally pleasant for the time of year. With but three cloudy days during the month and those at the beginning and ending of the period, an unusually long interval of fair weather occurred.

An unusually light precipitation, in fact, the smallest for March since 1889, was a very noticeable feature; especially as nearly the whole of it occurred during the first week of the month. The transition from Winter to Spring was practically completed during the month, and when the month closed the season was about three weeks in advance of normal conditions.

The records of the various weather elements show the following features: The mean pressure was high, and the range considerably less than usual. The fluctuations were not large for this season of the year. While the total wind movement was about normal, the changes of direction were more numerous than usual.

The mean temperature was about six degrees higher than the normal, and the range considerably greater than usual. Several of the daily maximums near the end of the month were unusually high; the highest of these—78 degrees—has been succeeded but once in March during the past twenty years. The minimum for the month was nearly eight degrees above the normal. The mean dew point was nearly three degrees above the normal, and the relative humidity slightly lower than usual.

The total precipitation was about one-third of the normal, and all of it occurred as rain. There was a thunder storm on the evening of the 6th and morning of the 7th, and since that time but little precipitation has been noted.

The number of hours of bright sunshine was the largest for March on our records here. The large difference between this record and the amount of cloudiness observed is largely due to the fact that the mornings and evenings, when the observed cloudiness is taken, were much more cloudy than during the middle of the day.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 256. APRIL, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.09, 17th, 7 A.
Minimum reduced to freezing, 29.20, 7th, 2 A.
Reduced† maximum reading, 30.40, 17th, 7 A.
Reduced† minimum reading, 29.50, 7th, 2 A.
Mean semi-daily reduced, ... 29.965
Monthly range, ... 0.90

****Air Temperature.*** In Degrees Fahr.

Highest, ... 80.0, 5th, 5 P.
Lowest, ... 24.0, 11th, 6 A.
Mean hourly, ... 50.6
Mean of means of max. and min., ... 50.4
Mean sensible (wet bulb), ... 44.6
Monthly range, ... 56.0
Highest mean daily, ... 62.2, 6th
Lowest mean daily, ... 38.5, 11th
Mean maximum, ... 62.4
Mean minimum, ... 38.4
Mean daily range, ... 24.0
Greatest daily range, ... 39.0, 3d
Least daily range, ... 9.0, 25th

Humidity.

Mean dew point, ... 39.2
Mean force of vapor, ...362
Mean relative humidity, ... 69.1

Precipitation. In inches.

Total precipitation, ... 3.07
Number of days on which .01 inch or more rain or melted snow fell, ... 8
Total snow in inches . . . . . none

Wind.

Total movement, ... 5533m.
Greatest daily movement, ... 379m., 8th
Least daily movement, ... 43m., 5th.
Mean daily movement, ... 184m.
Mean hourly velocity, ... 7.7 m.
Maximum pressure per square foot, 6.0 lbs.= 35m. per hour, 28th, 11 A., E.N.E.
Maximum velocity for 5 minutes, 32m. per hour 6th, 5P., S.S.W.
Prevailing Direction, West.

Summary.

West Northwest . . . . . 23 per cent.
South Southwest . . . . . 17 " "
South . . . . . 13 " "
Other directions, ... 47 " "

Weather.

Mean cloudiness observed, ... 56 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 116 hrs.=29 per cent.
Number of clear days, ... 16
Number of fair days, ... 10
Number of cloudy days, ... 4

Bright Sunshine.

Number of hours recorded, . . 286 hrs.=71%

Rain, 4th, 6th, 7th, 8th, 9th, 11th, 17th, 18th, 19th, 22d, 25th, 26th, 29th, 30th.

Frosts, 11th, 13th, 17th, 29th.

Lightning, 9th.

Gales, 35 miles or more per hour; 35m, 28th, E.N.E.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.22	30.12	30.170	69.0	5 P	42.5	6 A	55.7	52.8	43.3	12.3
2	30.26	30.11	30.160	68.0	3 P	31.5	6 A	49.7	49.9	39.5	12.0
3	30.35	30.23	30.322	67.0	3 P	28.0	6 A	47.5	48.7	37.0	12.0
4	30.32	30.05	30.183	52.0	12 M	36.0	6 A	44.0	46.0	42.7	2.5
5	30.05	29 86	29.943	80.0	5 P	48.0	6 A	64.0	61.4	55.0	10.2
6	29.86	29.53	29.670	78.0	3 P	51.5	9 A	64.7	62.2	55.7	8.5
7	29.69	29.50	29.628	61.0	0 A	41.0	12 P	51.0	49 2	43.0	10.0
8	29.75	29 69	29.800	47.0	2 P	36.0	12 P	41.5	40.7	36.5	8.1
9	29.87	29.74	29.824	51.0	3 P	34.0	6 A	42.5	43.0	38.5	8.2
10	29.94	29.79	29.868	52.0	3 P	32.0	12 P	42 0	41.7	36.0	10.8
11	29.99	29.86	29.954	52.5	12 M	24 0	6 A	38.3	38.5	37.7	9.1
12	30.04	29.85	29.920	51.0	4 P	35.0	12 P	43.0	42.0	37.7	12.5
13	30.10	29 99	30.065	57.0	3 P	26.5	6 A	41.7	43.3	38.3	12.7
14	30.06	29.89	29.984	68 0	2 P	30 0	6 A	49.0	52.3	44.3	11.8
15	29.96	29.79	29.900	75.0	5 P	44 0	6 A	59 5	58.9	47 0	12.0
16	30.35	29.95	30.191	59.0	2 P	35.0	12 P	47.0	48.4	38.5	11.1
17	30.40	30.25	30.323	56 0	1 P	28.5	6 A	42.3	44.2	39 7	9.7
18	30.25	29.79	29 986	61.0	5 P	42.5	6 A	51.7	52.4	51.7	0.0
19	29 80	29.69	29.758	72.0	2 P	51.5	5 A	61 7	60.5	56 5	8.6
20	29.78	29.67	29 751	64.0	3 P	43.0	12 P	53.5	56 0	48.0	11.1
21	29 87	29.78	29.850	67.0	2 P	32.0	5 A	49 5	52.2	45 3	10.9
22	29.84	29 68	29.750	63.0	3 P	41.0	5 A	52.0	52.1	44 3	9.0
23	29.99	29 77	29.896	74.0	4 P	38 0	5 A	56.0	56.7	50.7	12.3
24	30.14	29.99	30.096	60.0	4 P	49 0	12 P	54.5	53 9	51.3	10.5
25	30 21	30.12	30.164	57.0	6 P	48.0	4 A	52.5	53.0	50.5	1.9
26	30.17	29.91	30.004	66.0	3 P	52.0	12 P	59.0	58 7	56.0	6.1
27	29.94	29 85	29.902	65.5	3 P	44.0	6 A	54.7	55.0	48.0	12.5
28	30.08	29.84	30.050	52.0	4 P	36.0	12 P	44.0	44.9	35.5	12.7
29	30.14	29 96	30.067	57.5	3 P	31.0	5 A	44.3	44.5	39 3	10.7
30	29.97	29 60	29.782	69.5	6 P	39.0	3 A	54.3	53.9	51.7	6.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	35.0	.360	56.5	N.W.	158	1.0	14	8 A				
2	28.5	.323	50.0	N.N.W.	106	1.0	14	5 P				
3	24.0	.304	44.0	W.	89	1.5	17	8 P				
4	40.0	.300	85.0	S.	73	0.0	—	—	7 A	10 P	.05	
5	53 0	.504	82.5	S.	43	0.0	—	—				
6	54.0	.508	85.0	S.S.W.	243	4.5	30	6 P	8 P		T	
7	39.0	.323	75.5	N.N.W.	260	2.0	20	2 A	4 P		T	
8	31.5	.248	72 0	N.N.W.	379	4.5	30	8 A	6 P	10 P	.01	
9	34.0	.262	76.0	N.N.W.	172	1.5	17	9 A	12 M	4 P	T	
10	35 5	.251	67.5	N.	280	4 0	28	8 A				
11	34.5	.250	80.5	W.S.W.	125	4.5	30	1 P	4 P	12 P	.54	
12	30.5	.273	62.0	N.N.W.	183	1.0	14	12 M				
13	29.0	.294	55.0	N.W.	205	4.5	30	4 P				
14	35.5	.403	52.5	W.N.W.	178	3.0	24	1 P				
15	36.5	.453	49 0	N.N.W.	111	0.0	—	—				
16	29.5	.294	56.5	E.S.E.	193	1.0	14	6 P				
17	32.5	.304	59 5	S.	219	2.5	22	9 A	8 P	12 P	T	
18	51.0	.401	96.5	S.	186	1.5	17	1 P	0 A	12 P	.45	
19	56.5	.483	96.0	S.S.W.	177	1.5	17	2 P	0 A	10 P	.03	
20	42 5	.408	67 5	S. W.	285	3.0	24	11 A				
21	38.5	.385	62.0	S.E.	100	0.0	—	—				
22	37.5	.366	61.0	N.N.E.	176	5.0	32	4 P	2 P	4 P	T	
23	46.0	.445	70 5	S.S.W.	79	0.5	10	10 P				
24	49.5	.417	83.0	S.E.	141	0 5	10	6 P				
25	47.0	.415	78.5	E.S.E.	140	2 0	20	7 P	9:30 A	12 P	.30	
26	55.5	.469	93.0	.S.SW.	263	3.0	24	5 A	0 A	10 P	1.56	
27	41.5	.423	61.5	W.N.W.	173	4.5	30	2 P				
28	25.5	.260	53.5	E.N.E.	310	6.0	35	11 A				
29	32.0	.290	63.5	N.N.W.	158	3.0	24	4 P	*8 P	12 P	T	
30	49.0	.451	79.5	S.S.W.	328	4.0	28	9 A	0 A	2 P	.13	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The season's advance, so marked at the close of last month, was slightly checked during April. Although the month was considerably warmer than usual—in fact, the mean temperature was higher than any previous April record at this station—variations in temperature were rather marked, and some of the coolest days occurred near the end of the month. The precipitation record, following the unusually small amount of the previous month, continued light until the storm of the 25th-26th, when more than one-half the total for the month fell.

Comparing the records with the normals for the station, the following features are noted: The mean barometer was practically normal and the range unusually small for the time of year. Changes of pressure were generally small and slow. The wind directions were more variable than usual.

The mean temperature was about five degrees higher than the normal, and the maximum and minimum both a few degrees above the April normal for these records. The range was rather small.

Although the first three weeks of the month were much dryer than usual, the heavy precipitation of the last week made the total for the month slightly more than normal. The mean dew point was slightly below, and the relative humidity a little above the normal.

While the total wind movement was a little more than the average only a single gale was recorded.

The amount of sunshine recorded was unusually large and the number of cloudy days correspondingly small.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 257. MAY, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 10, 16th, 8 A.
Minimum reduced to freezing,	29.09, 31st, 4 P.
Reduced† maximum reading,	30.40, 16th, 8 A.
Reduced† minimum reading,	29.38, 31st, 4 P.
Mean semi-daily reduced,	29.962
Monthly range,	1.02

****Air Temperature.*** In Degrees Fahr.

Highest,	84.0, 24th, 4 P.
Lowest,	31.0, 6th, 5 A.
Mean hourly,	56.1
Mean of means of max. and min.,	57.0
Mean sensible (wet bulb),	50.2
Monthly range,	53.0
Highest mean daily,	69.9, 24th
Lowest mean daily,	45.2, 5th
Mean maximum,	67.7
Mean minimum,	46.3
Mean daily range,	21.4
Greatest daily range,	37.0, 20th
Least daily range,	7.0, 9th

Humidity.

Mean dew point,	45.5
Mean force of vapor,	.443
Mean relative humidity,	71.6

Precipitation. In inches.

Total precipitation,	2.67
Number of days on which .01 inch or more rain or melted snow fell,	16

Wind.

Total movement,	5289m.
Greatest daily movement,	313m., 4th.
Least daily movement,	74m., 16th.
Mean daily movement,	171m.
Mean hourly velocity,	7.1 m.

Maximum pressure per square foot, 7.5 lbs.= 39m. per hour, 7th, 3 P., W.N.W.

Maximum velocity for 5 minutes, 30m. per hour 28th, 5P., N.

Prevailing Direction, West.

Summary.

West Northwest	29 per cent.
South Southwest	13 " "
Southwest	13 " "
North Northwest	10 " "
Other directions,	35 " "

Weather.

Mean cloudiness observed,	66 per cent.
Total cloudiness recorded by the Sun Thermometer,	166 hrs.=37 per cent.
Number of clear days,	13
Number of fair days,	14
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 287 hrs.=63%

Rain, 1st, 2d, 3d, 4th, 5th, 8th, 9th, 10th, 13th, 14th, 18th, 21st, 23d, 24th, 25th, 26th, 27th, 30th, 31st.

Frost, 6th.

Gales, 35 miles or more per hour; 39m, 3d, S.S.E.; 37m, 4th, N.N.W.; 39m, 7th, W.N.W.; 37m, 28th, N.

Thunder and Lightning, 1st, 2d, 3d, 14th, 18th.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.19	29 92	30.123	66.5	4 P	45.0	6 A	55.7	54.7	46.5	13.1
2	30.22	30.05	30.160	72.0	5 P	42.0	5 A	57.0	54.1	47.7	9.8
3	30.13	29.90	30.044	70.5	3 P	44.0	2 A	57.3	54.2	49.7	8.5
4	30.14	30.02	30.120	52.0	3 P	43.0	12 P	47.5	47.2	42.5	8.2
5	30.16	30.08	30.138	55.0	5 P	38.5	6 A	46 7	45.2	38.5	10.7
6	30.15	29.92	30.030	61.5	4 P	31.0	5 A	46.3	47.5	40.5	13.5
7	30.03	29.82	29.935	69.0	4 P	59.0	3 A	64 0	56.0	48.5	13.0
8	29.97	29.87	29.934	69.5	11 A	46.5	4 A	58.0	57.1	52.5	8.3
9	29.87	29.56	29.697	62.0	5 P	55.0	3 A	58.5	57.8	55.3	0.6
10	29.78	29.62	29.730	64.0	2 P	48.0	9:30 P	56.0	54.9	45 0	11.7
11	29 77	29.63	29.723	61.0	2 P	46 0	10 P	53.5	52.8	47.3	11.4
12	29.88	29.74	29.824	66.0	3 P	35.5	5 A	50.7	51.4	44.5	13.8
13	30.01	29.88	29.958	64.0	2 P	39.0	5 A	51.5	52.3	45.3	11.1
14	30.13	30.01	30.097	62.0	3 P	43 0	12 P	52.5	49.7	45.0	7.1
15	30.31	30.13	30.258	62 0	4 P	40.0	3 A	51.0	50.8	48.3	8.5
16	30.40	30.31	30 386	70.0	4 P	35 0	5 A	52 5	54.3	47.0	12.8
17	30.38	30.15	30.210	73 5	3 P	37 5	5 A	55.5	57.4	47.5	12.4
18	30.15	29.75	29 838	62.5	4 P	45.0	12 P	53.7	51.5	49.3	0.5
19	30.08	29.80	29.943	69 0	4 P	45 0	0 A	57.0	55.9	47.5	11.5
20	30.12	29.96	30.060	75.0	2 P	38.0	5 A	56.5	59.7	51.3	11.1
21	30.03	29.85	29.926	70.0	2 P	57.0	12 P	63.5	61.1	57.3	5.9
22	30.14	30.03	30.130	70 5	3 P	53 0	5 A	61.7	60.4	55 0	8.9
23	30.10	29.80	29.994	70.0	1 P	53 0	5 A	61.5	60.7	57.0	4.4
24	29 81	29.71	29 782	84.0	4 P	61.0	6 A	72.5	69.9	64.5	10.6
25	29.78	29.72	29 749	73.5	1 P	61.5	12 P	67.5	65.7	63 5	2.5
26	30 00	29.74	29 886	69.0	4 P	52.0	11 P	60.5	61 9	55.5	11.5
27	30.08	30.00	30.062	65 0	3 P	50 0	12 P	57.5	56.4	48.7	10.1
28	30.07	29.96	30.036	76.5	4 P	44.0	4 A	60.3	61.5	55.3	12 7
29	30.04	29 78	29.902	80 5	3 P	45.5	5 A	63 0	63 5	55.5	10.0
30	29.78	29 56	29 652	68 0	12 M	52.0	12 P	60.0	58.7	53.5	7.4
31	29.56	29.38	29.440	65.0	3 P	50.0	6 A	57.5	55.8	51.0	7.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	39.5	.398	62.0	W.S.W.	193	1.5	17	1 A	11 P	12 P	T	
2	44.5	.386	76.5	S.	92	0.0	—	—	0 A	5 A	.09	
3	48.0	.379	90.0	W.N.W.	158	7.5	39	7 P	6 A	11 P	.09	
4	38.5	.306	76.5	N.N.W.	313	7.0	37	8 A	8 P	12 P	T	
5	28.0	.291	55.0	N.	240	4.5	30	1 P	0 A	12 M	.10	
6	31.0	.330	53.0	N.W.	167	2.0	20	1 P				
7	39 0	.479	50.0	W.N.W.	248	7.5	39	3 P				
8	47.0	.485	68.5	S.S.W.	164	2.0	20	1 P	1 P	12 P	.04	
9	53.0	.485	83.0	W.	153	0.0	—	—	0 A	4 P	.42	
10	37 0	.390	57.0	W.N.W.	292	5.0	32	11 P	5:30 P	11 P	.01	
11	42.5	.388	70.5	W.N.W.	226	5.0	32	2 P				
12	37.0	.455	59.0	W.N.W.	98	0.5	10	6 P				
13	37.5	.390	57.5	N.N.E.	142	1.0	14	9 A	4 P	12 P	T	
14	42.5	.325	84.5	S.W.	131	1.0	14	3 P	0 A	12 P	.17	
15	46.0	.372	83.5	W.N.W.	82	0.0	—	—				
16	40.5	.418	61.0	E.S.E.	74	0.0	—	—				
17	39.0	.440	55 5	S.S.W.	160	1.5	17	7 P				
18	47.5	.370	90.0	S.S.W.	236	5.0	32	5 P	7 A	6 P	.42	
19	39.5	.425	58.5	N.N.W.	272	3.5	26	10 A				
20	44.5	.507	59.5	S.W.	104	0 5	10	4 P				
21	56.0	.504	88.5	S.W.	111	0.0	—	—	1 A	11 P	.25	
22	53.0	.517	77.0	W.S.W.	106	0.0	—	—				
23	56.0	.501	88.5	W.N.W.	170	2.0	20	4 P	8 P	12 P	.03	
24	63.0	.674	85.5	W.N.W.	218	3.0	24	3 P	0 A	12 P	.04	
25	62.5	.616	92.5	S.	304	3.0	24	5 A	1 P	12 P	.05	
26	53.0	.512	78.0	S.W.	200	1.0	14	1 P	0 A	5 A	.09	
27	43 5	.414	69.5	N.N.W.	106	0.0	—	—	8 A	10 P	.02	
28	49.5	.581	60.0	N.	201	7.0	37	4 P				
29	50 0	.550	65.0	S.S.W.	95	0.5	10	7 P				
30	52 5	.437	88.0	E.	151	1.5	17	3 P	6:30 A	8 P	.12	
31	49 0	.406	86.5	W.N.W.	82	0.0	—	—	3 A	9 A	.73	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during May was generally disappointing, and compared unfavorably with the exceptionally pleasant March and the agreeable conditions of April.

While the several elements show but little that is abnormal, the season's progress seems to have been considerably arrested during the month. The amount of cloudiness observed in the morning and evening was large. although there were but few days which could be classed as cloudy.

The following features are noted on comparing the records with those of previous years: The mean barometer was practically normal and the range a little more than usual. The minimum pressure was rather low and occurred on the last day of the month. The wind directions from the westerly points of the compass were more numerous than usual.

The mean temperature was practically normal and the maximum nearly three degrees lower than usual, giving a rather small range.

The mean dew point was lower than the normal, while the relative humidity was about four points above the normal.

Although a measurable amount of rain fell on more than half the days of the month, the amount of precipitation was only about 70 per cent. of the normal. The last day of the month showed the greatest precipitation, coincident with the low barometer.

The total wind movement was considerably more than the normal, but only a few moderate gales were noted.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 258. JUNE, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.94, 26th, 6 A.
Minimum reduced to freezing,	29.11, 1st, 4 A.
Reduced† maximum reading,	30.24, 26th, 6 A.
Reduced† minimum reading,	29.41, 1st, 4 A.
Mean semi-daily reduced,	29.920
Monthly range,	0.83

****Air Temperature.*** In Degrees Fahr.

Highest,	88.0, 15th, 3 P.; 21st, 3 P.
Lowest,	35.0, 5th, 5 A.
Mean hourly,	63.8
Mean of means of max. and min.,	63.7
Mean sensible (wet bulb),	58.8
Monthly range,	53.0
Highest mean daily,	75.7, 22d
Lowest mean daily,	50.9, 1st
Mean maximum,	74.5
Mean minimum,	52.9
Mean daily range,	21.6
Greatest daily range,	32.0, 3d
Least daily range,	4.0, 11th

Humidity.

Mean dew point,	55.2
Mean force of vapor,	.607
Mean relative humidity,	75.4

Precipitation. In inches.

Total precipitation,	2.65
Number of days on which .01 inch or more rain or melted snow fell,	10

Wind.

Total movement,	3685m.
Greatest daily movement,	243m., 4th.
Least daily movement,	49m., 12th.
Mean daily movement,	123m.
Mean hourly velocity,	5.1 m.

Maximum pressure per square foot, 4.0 lbs.= 28m. per hour, 4th, 6A., N. N. W. 9th, 5P., S. W.

Maximum velocity for 5 minutes, 28m. per hour 4th, 4P., S.W.

Prevailing Direction, West.

Summary.

West	17 per cent.
North Northeast	13 " "
North Northwest	13 " "
South Southwest	10 " "
Northwest	10 " "
Other directions,	37 " "

Weather.

Mean cloudiness observed,	59 per cent.
Total cloudiness recorded by the Sun Thermometer,	178 hrs.=39 per cent.
Number of clear days,	8
Number of fair days,	16
Number of cloudy days,	6

Bright Sunshine.

Number of hours recorded, 279 hrs.=61%

Rain, 1st, 5th, 9th, 10th, 11th, 12th, 16th, 17th, 18th, 24th, 27th, 28th.

Lightning, 9th, 23d.

Gales, none.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.50	29.41	29.453	54.0	11 A	48.5	12 P	51.3	50.9	48.3	2.0
2	29.71	29.50	29.622	59.0	4 P	43.5	5 A	51.3	52.2	49.3	6.3
3	29.98	29.70	29.820	73.0	2 P	41.0	4 A	57.0	58.5	54.5	10.0
4	30.11	29.98	30.096.	70.0	4 P	42.0	5 A	56.0	53.5	43.7	13.8
5	30.15	29.95	30.070	66.0	2 P	35.0	5 A	50.5	52.6	46.5	10.0
6	29.95	29.81	29.842	66.5	5 P	50.0	0 A	58.3	56.5	52.3	8.7
7	29.90	29.78	29.846	67.0	12 M	49.0	12 P	58.0	57 9	54.3	12.0
8	30.08	29.89	29.994	68.5	2 P	45.0	5 A	56.7	57.0	52.3	11.8
9	30.14	30.06	30.106	73.0	11 A	45.0	5 A	59.0	59.9	56.3	9.7
10	30.14	30.05	30.112	59.0	3 P	52.0	5 A	55.5	55.4	52.3	2.0
11	30.15	30.08	30.126	55.0	5 P	51.0	12 P	53.0	53.1	51.7	0.0
12	30.14	30.00	30.085	58.0	6 P	51.0	6 A	54.5	54.4	54 0	0.0
13	30.00	30.01	30.053	76.0	2 P	52.5	5 A	64.3	65.2	61.0	10.5
14	30.04	29.94	29.991	85.5	3 P	55.0	5 A	70.3	71.5	63.5	11.5
15	30.01	29.93	29.982	88.0	3 P	59.0	6 A	73.5	72.6	66.0	11.3
16	30.08	30.01	30.047	69.0	1 P	60.0	5 A	64.5	64.5	61.7	2.5
17	30.04	29.82	29.919	78.0	4 P	60.5	5 A	69.3	66.1	63.0	6.8
18	29.82	29.62	29.674	78.0	5 P	61.0	12 P	69.5	66.8	64.5	5.7
19	29.85	29.67	29.768	86.0	5 P	58.0	5 A	72.0	72.1	67.5	13.3
20	29.91	29.85	29.882	85.5	3 P	56.5	5 A	71.0	72.9	65.3	13.6
21	29.89	29.80	29.852	88.0	3 P	61.0	5 A	74.5	75.5	69.0	13.3
22	29.91	29.80	29.859	87.0	3 P	59 0	5 A	73.0	75.7	68.3	12.3
23	29.93	29.76	29.798	84.0	2 P	62.0	12 P	73.0	74.7	66.7	12.5
24	30.11	29.93	30.010	76.0	2 P	54.0	5 A	65 0	67.0	61.0	13.7
25	30.21	30.10	30.199	79.0	2 P	57.0	12 P	68.0	65.5	59.5	11.4
26	30.24	30.04	30.135	81.0	3 P	53.5	5 A	67.3	67.0	58.0	11.3
27	30.07	29.73	29.861	79.0	1 P	59.0	5 A	69.0	67.9	61.7	9.0
28	29.74	29.65	29.692	81.0	1 P	60.5	12 P	70.7	70.6	66.7	9.3
29	29.89	29 74	29.827	80.5	5 P	52.5	5 A	66.5	67.5	61.7	13.6
30	29.91	29.83	29.882	84.0	4 P	51.5	5 A	67.7	69.6	63.3	11.9

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	46.0	.364	87.0	W.S.W.	176	0.5	10	7 A	1 P	6 P	T	
2	46.0	.348	78.0	W.	169	0.0	—	—				
3	51.0	.501	75.0	N.N.W.	82	1.5	17	10 P				
4	34.5	.379	52.0	N.	243	4.0	28	6 A				
5	39.0	.407	59.0	S.	133	2.0	20	8 P	5 P	12 P	.28	
6	50.0	.428	84.5	W.	158	0.5	10	2 A				
7	50.5	.494	75.5	N.W.	130	1.5	17	2 P				
8	48.0	.477	70.5	N.W.	163	2.0	20	12 M				
9	52.5	.562	73.0	S.S.W.	107	4.0	28	5 P	1 P	12 P	.17	
10	50.5	.423	85.5	N.E.	155	1.5	17	2 P	0 A	12 P	.50	
11	50.0	.405	90.5	N.N.E.	127	0.0	—	—	0 A	12 P	.57	
12	53.0	.433	94.0	N.N.E	49	0.0	—	—	0 A	11 P	.27	
13	57.5	.644	74.0	W.	164	1.0	14	11 A				
14	58.0	.770	63.5	W.N.W.	88	0.0	—	—				
15	62.5	.721	73.5	W.	63	0.0	—	—				
16	60.0	.589	89.5	S.S.E.	52	0.0	—	—	9 A	12 P	.52	
17	61.5	.623	88.5	S.S.E.	51	0.0	—	—	0 A	12 P	.04	
18	63.5	.634	93.5	N.N.E.	96	0.0	—	—	1 P	5 P	.24	
19	64.5	.810	76.0	N.	104	0.0	—	—				
20	61.5	.786	69.5	N.N.W.	90	0.5	10	10 P				
21	65.0	.910	69.0	W.	141	0.0	—	—				
22	63.0	.942	61.5	W.S.W.	99	0.5	10	5 P				
23	63.0	.842	68.5	N.W.	112	0.5	10	4 P				
24	57.0	.674	69.5	N.N.E.	142	3.5	26	4 P	11 A	10 P	T	
25	56.5	.592	78.0	S.E.	68	0.0	—	—				
26	53.5	.596	71.0	S.S.W.	155	1.0	14	6 P				
27	58.5	.655	75.5	S.S.W.	239	2.5	22	5 P	9 P	11 P	.03	
28	64.0	.749	81.5	W.N.W.	108	0.0	—	—	0 A	8 P	.03	
29	57.5	.705	66.0	N.N.W.	128	1.5	17	2 P				
30	59.0	.742	68.0	N.W.	93	0.5	10	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during June presented no marked departure from normal conditions, although, in general, records were below normal values. The departures from mean conditions were most noticeable in connection with the temperature and precipitation.

The usual comparison of the monthly records with the normals for this station shows the following features: The mean barometer was considerably lower than the normal, and the range was slightly greater than usual. The fluctuations in pressure were generally slow. Both the maximum and minimum records were considerably below the normal values.

The mean temperature was two degrees lower than usual, and the range was practically normal. The maximum temperature was nearly four degrees lower than the June normal, and the minimum was very close to the frost line, being, in fact, the lowest since 1891. The first third of the month was especially cool.

The mean dew point was rather low, while the relative humidity was three points above the normal.

The total precipitation was about one inch less than the normal. Scarcely any rain fell during the last third of the month.

The total wind movement was practically normal, and on many dates the wind was so light that no pressure was recorded. No gales were noted during the month.

The amount of sunshine was above the average, and eighty per cent of the days were either clear or fair. No thunder storms occurred in the immediate vicinity, although distant lightning was noted on two dates.

J. E. OSTRANDER, Meteorologist

C. M. DAMON, Observer.

BULLETIN No. 259. JULY, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29 89, 12th, 7A.; 19th, 12 P.
Minimum reduced to freezing. 29.32, 30th, 3 P.
Reduced† maximum reading, 30.18, 12th, 7 A.; 19th, 12 P.
Reduced† minimum reading, . 29.61, 25th, 4 P.; 30th, 3 P.
Mean semi-daily reduced, ... 29.888
Monthly range, ... 0.57

****Air Temperature.*** In Degrees Fahr.

Highest, ... 97.0, 24th, 3 P.
Lowest, ... 48.5, 5th, 5 A.
Mean hourly, ... 72.1
Mean of means of max. and min., ... 72.2
Mean sensible (wet bulb), ... 64.8
Monthly range, ... 48.5
Highest mean daily, ... 80.1, 10th
Lowest mean daily, ... 64.0, 19th
Mean maximum, ... 85.2
Mean minimum, ... 59.2
Mean daily range, ... 26.0
Greatest daily range, ... 36.0, 24th
Least daily range, ... 17.0, 26th

Humidity.

Mean dew point, ... 61.0
Mean force of vapor, ...774
Mean relative humidity, ... 70.3

Precipitation. In inches.

Total precipitation, ... 1.90
Number of days on which .01 inch or more rain fell, ... 9

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3812m.
Greatest daily movement, ... 278m., 21st.
Least daily movement, ... 37m., 1st.
Mean daily movement, ... 123m.
Mean hourly velocity, ... 5.1 m.
Maximum pressure per square foot, 6.0 lbs.= 35m. per hour, 4th, 1P., N. N. E.
Maximum velocity for 5 minutes, 24m. per hour 4th, 1P., N.N.E.
Prevailing Direction, West Southwest.

Summary.

Southwest	19 per cent.
South	16 " "
South Southwest	13 " "
West	13 " "
Northwest	10 " "
Other directions	29 " "

Weather.

Mean cloudiness observed, ... 34 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 91 hrs.=20 per cent.
Number of clear days, ... 17
Number of fair days, ... 14
Number of cloudy days, ... 0

Bright Sunshine.

Number of hours recorded, . . 371 hrs.=80%

Rain, 7th, 8th, 12th, 16th, 19th, 22d, 25th, 26th, 27th, 28th, 30th.

Gales, 35 or more miles per hour: 35 m, 4th, N.N.E.

Thunder and Lightning, 12th, 16th, 22d. 25th, 27th, 28th, 30th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Mimimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.89	29.77	29.809	82.0	4 P	57.5	5 A	69.7	70.5	65.0	11.5
2	29.80	29.72	29.757	90.0	4 P	62.5	6 A	76.3	75.9	69.0	12.0
3	29.82	29.70	29.773	86.0	2 P	64.0	6 A	75.0	76.4	72.0	11.2
4	30.04	29.63	29.784	79.5	3 P	53.0	12 P	66.3	70.8	61.3	12.8
5	30.12	30.04	30.101	84.0	3 P	48.5	5 A	66.3	67.4	60.3	14.3
6	30.11	29.99	30.047	89.0	4 P	53.5	5 A	71.3	71.1	61.0	14.2
7	30.01	29.76	29.835	85.0	2 P	53.5	5 A	69.3	71.0	66.3	12.8
8	29.88	29.73	29.769	89.0	3 P	64.5	2 A	76.7	75.9	69.7	11.1
9	29.95	29.88	29.923	91.5	4 P	62.5	5 A	77.0	77.2	69.3	6.2
10	29.93	29.81	29.886	93.5	3 P	66.0	5 A	79.7	80.1	74.3	13.0
11	30.11	29.86	29.998	88.0	4 P	64.0	12 P	76.0	77.0	67.3	13.8
12	30.18	30.01	30.098	87.0	2 P	55.5	4 A	71.3	72.9	63.3	12.9
13	30.06	29.90	29.953	85.0	4 P	66.0	12 P	75.5	73.3	64.5	10.2
14	30.12	30.01	30.062	88.0	4 P	56.0	5 A	72.0	73.2	64.3	14.0
15	30.03	29.83	29.878	88.0	3 P	56.5	5 A	72.3	73.3	64 0	13.8
16	29.83	29.70	29.738	78.0	11 A	59.0	5 A	68.5	66.2	64.3	7.5
17	29.90	29.70	29.797	83.0	4 P	59.0	4 A	71.0	68.2	58.7	12.6
18	30.06	29.90	29.995	74.5	4 P	56.5	5 A	65.5	64.3	57.7	10.8
19	30.18	30.06	30.140	76.0	1 P	51.5	5:30 A	63.7	64.0	60.3	11.5
20	30.18	30.08	30.127	83.0	4:30 P	51.0	4:30 A	67.0	67.6	60.5	13.8
21	30.09	29.92	29.998	87.0	0:30 P	59.5	5 A	73.3	72.3	62.7	12.8
22	29.96	29.84	29.893	80.5	3 P	62.5	5 A	71.5	70.4	64.7	11.3
23	30.05	29.92	29.988	86.0	3 P	60.5	6 A	73.3	73.0	66.3	12.8
24	30.05	29.87	29.947	97.0	3 P	61.0	5 A	79.0	78.1	70.5	11.6
25	29.87	29 61	29.713	92.0	0:30 P	70.0	12 P	81.0	79.0	71.7	10.9
26	29.77	92.65	29.708	81.5	3 P	64.5	5:30 A	73.0	73.5	64.5	13.1
27	29.76	29.67	29.723	88.5	3 P	62 0	6 A	75.3	75.6	67.7	12.6
28	29.83	29.63	29.734	85.0	4 P	62.0	6 A	73.5	71.7	63.5	11.0
29	29.88	29 80	29.845	86.5	3 P	55 5	5 A	71.0	71.6	63 0	13.9
30	29.81	29.61	29.680	78.0	2 P	60 5	4:30 A	69.3	66.0	61.5	7.2
31	29.93	29.68	29.815	79.0	3 P	55 5	5 A	67.3	68.3	60.5	13.8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	62.0	.739	76.5	S.W.	37	0.0	—	—				
2	66.0	.842	76.5	S.	60	0.0	—	—				
3	69.5	.915	80.5	S.W.	80	0.0	—	—				
4	56.5	.715	65.0	N.	246	6.0	35	1 P				
5	56.5	.684	73.0	W.S.W.	75	0.0	—	—				
6	55.5	.710	63.5	S.S.E.	81	0.0	—	—				
7	63.3	.746	80.0	S.S.W.	172	1.0	14	2 P	10 P	12 P	.20	
8	68.0	.848	80.5	W.	91	0.0	—	—	0 A	2 A	.35	
9	66.5	.863	76.0	W.	57	0.0	—	—				
10	71.5	1.005	78.0	S.S.W.	177	1.0	14	2 P				
11	63.5	.895	64.5	N.W.	183	0.0	—	—				
12	58.0	.789	61.5	S.S.W.	128	0.5	10	12 M	11 A	12 M	.20	
13	60.0	.767	70.0	W.	171	1.0	14	4 P				
14	59.5	.808	62.5	S.W.	74	0.0	—	—				
15	59.0	.816	60.5	W.	103	0.0	—	—				
16	62.0	.703	81.0	N.W.	79	0.0	—	—	12 M	7 P	.09	
17	54.5	.645	67.5	N.N.W.	99	2.5	22	9 A				
18	50.5	.577	55.0	N.N.E.	89	0.0	—	—				
19	56.0	.651	70.0	N.N.E.	58	0.0	—	—	2 P	3 P	.01	
20	56.5	.666	69.0	S.	61	0.0	—	—				
21	58.5	.750	64.5	S.	278	3.5	26	6 P				
22	62.5	.728	77.0	S.	236	1.0	14	3 P	9 P	10 P	.17	
23	62.0	.761	66.5	S.W.	87	0.0	—	—				
24	68.0	.922	75.0	S.S.W.	112	1.5	17	6 P				
25	69.0	.954	74.0	S.W.	194	1.5	17	1 P	2 P	3 P	.02	
26	59.5	.821	61.5	W.N.W.	206	3.0	24	3 P	9:30 P		T	
27	63.0	.918	63.0	S.W.	125	0.0	—	—	11 P	12 P	T	
28	61.0	.685	79.0	E.	123	0 0	—	—	0 A	4 A	.30	
29	59.5	.720	69.5	W.S.W.	62	0.0	—	—				
30	59.0	.620	81.5	S.	130	1.5	17	2 P	7:30 A	3 P	.56	
31	54.0	.732	57.5	N.W.	138	0.5	10	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during July was unusually dry and warm with an excessive amount of sunshine. During the entire month not a single day showed less than six hours of sunshine and consequently there were no cloudy days recorded.

An analysis of the records shows the following features characterizing the several weather elements: The mean barometer was very low and the range comparatively small. The fluctuations in pressure were generally small and slow. The total wind movement was slightly more than the mean and a large amount was from the southwest quadrant.

The mean temperature was more than two degrees higher than the normal, and was but slightly below our highest July mean. The maximum and minimum were both high while the range was about an average value. Several abnormally high daily means were noted.

The mean dew point was practically normal and the relative humidity was considerably below the normal.

The total precipitation was about forty per cent of the normal and much of it occurred during thunder storms. It was fairly well distributed throughout the month. Thunder and lightning of moderate intensity was noted on several dates.

More than half the days were clear, giving an abnormally large sunshine record.

J. E. OSTRANDER, Meteorologist

R. N. HALLOWELL, Acting Observer.

BULLETIN No. 260. AUGUST, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.08, 30th, 11 P.
Minimum reduced to freezing, 29.27, 4th, 4 P.
Reduced† maximum reading, 30.37, 30th, 11 P.
Reduced† minimum reading, 29.55, 4th, 4 P.
Mean semi-daily reduced, ... 30.071
Monthly range, ... 0.82

****Air Temperature.*** In Degrees Fahr.

Highest, ... 85.5, 14th, 3 P.
Lowest, ... 41.0, 27th, 6 A.
Mean hourly, ... 67.1
Mean of means of max. and min., ... 67.1
Mean sensible (wet bulb), ... 60.9
Monthly range, ... 44.5
Highest mean daily, ... 71.8, 15th
Lowest mean daily, ... 58.2, 27th
Mean maximum, ... 78.8
Mean minimum, ... 55.4
Mean daily range, ... 23.4
Greatest daily range, ... 36.5, 28th
Least daily range, ... 10.5, 16th

Humidity.

Mean dew point, ... 57.4
Mean force of vapor, ...639
Mean relative humidity, ... 76.3

Precipitation. In inches.

Total precipitation, ... 4.03
Number of days on which .01 inch or more rain fell, ... 7

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 4271m.
Greatest daily movement, ... 260m., 26th.
Least daily movement, ... 61m., 27th.
Mean daily movement, ... 138m.
Mean hourly velocity, ... 5.7 m.
Maximum pressure per square foot, 8.5 lbs.= 41m. per hour, 4th, 6P., W. N. W.
Maximum velocity for 5 minutes, 18m. per hour 25th, 5P., S.S.W.
Prevailing Direction, South Southwest.

Summary.

South Southwest . . . . . 23 per cent.
South . . . . . 19 " "
East Southeast . . . . . 10 " "
Southwest . . . . . 10 " "
West . . . . . 10 " "
West Northwest . . . . . 10 " "
Other directions . . . . . 18 " "

Weather.

Mean cloudiness observed, ... 47 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 200 hrs.=47 per cent.
Number of clear days, ... 14
Number of fair days, ... 15
Number of cloudy days, ... 2

Bright Sunshine.

Number of hours recorded, . . 229 hrs.=53%

Rain, 2d, 3d, 4th, 5th, 10th, 11th, 18th, 19th, 26th.

Gales, 35 or more miles per hour: 41 m, 4th, W.N.W.

Thunder and Lightning, 4th.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.03	29.93	30.013	80.5	4 P	49.5	5:30 A	65.0	66.8	59.7	13.8
2	30.05	29.94	30.029	81.0	4 P	57.5	5 A	69.3	68.1	62.3	9.9
3	30.08	29.95	30.021	78.5	3 P	61.5	6 A	70.0	70.4	67.0	8.8
4	29.95	29.55	29.734	79.5	4 P	64.0	12 P	71.7	71.2	66.5	6.4
5	29.77	29.66	29.733	76.0	2 P	55.0	12 P	65.5	66.6	57.5	13.7
6	29.91	29 73	29.832	73.5	1 P	53.5	2 A	63.5	64.4	58.5	11.0
7	29.98	29.90	29.918	80.0	3 P	54.5	6 A	67.3	68.6	61.0	13.2
8	30.01	29.94	29.989	79.0	1:30 P	56.5	6 A	67.7	68.0	56.7	11.3
9	30.09	30.01	30.063	80.0	3 P	61.0	6 A	70.5	69.1	63.0	12.3
10	30.10	30.01	30.059	70.0	12 M	59.0	2 A	64.5	63.5	61.0	3.2
11	30.03	29.93	29.989	82.0	3 P	61.0	3 A	71.5	68.6	62.0	10.8
12	30.15	30.03	30.102	83.0	2:30 P	53.0	6 A	68.0	68.0	63.0	13.3
13	30.19	30.10	30.148	84.0	3 P	52.0	6 A	68.0	68.0	60.0	12.8
14	30.14	30.02	30.082	85.5	3 P	56.5	6 A	71.0	71.6	63 7	11.0
15	30.10	30.04	30.088	80.5	2:30 P	67.5	8 A	74 0	71.8	67.5	9.2
16	30.24	30.05	30.128	72.0	11 A	61.5	12 P	66.7	68 5	63.3	6.9
17	30.36	30.24	30.333	76.0	3:30 P	55.5	12 P	65 7	66 6	58.7	11.4
18	30.35	30.06	30.225	74.5	3:30 P	49.0	3 A	61 7	62.0	58.0	8.3
19	30.06	29.93	29.977	79.0	4 P	53.0	12 P	66.0	67.2	59.3	9.3
20	30.10	30.02	30 067	78.0	3 P	45 5	6:30 A	61.7	62.2	57.0	13.1
21	30.13	30.05	30.109	82.0	3 P	47.0	6 A	64.5	64.7	56 0	12.4
22	30.14	30.08	30.122	78.0	2 P	57.5	6 A	67.7	67.6	61.0	12.3
23	30.12	30.03	30.092	80.5	3 P	56 5	7 A	68.5	68.2	63.7	11.1
24	30.13	30.09	30.131	80.5	2 P	63.5	5 A	72.0	71.0	67.3	9.1
25	30.13	29.94	30.018	84 5	2 P	66.5	3 A	75.5	74.4	70.5	10.0
26	30.17	29.88	29.999	77.0	8 A	50.0	12 P	63.5	67.1	63.3	9.3
27	30.25	30.14	30.213	75.0	3:30 P	41.0	6 A	58.0	58.2	52.7	12.6
28	30.23	30.14	30.210	80.0	4 P	43 5	6 A	61.7	62.1	54.3	11.7
29	30.29	30 16	30.218	81.5	4:30 P	56.0	7 A	68.7	66.4	59.3	9.6
30	30.37	30.29	30.332	77.5	4 P	55.0	12 P	66.3	64.8	54.7	12.0
31	30.36	30.12	30.239	74.5	2:30 P	53.0	4:30 A	63.7	64.2	58.5	9.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	56.0	.628	71.5	S.S.W.	101	0.5	10	2 P				
2	60.5	.629	85.0	S.S.W.	149	0.5	10	6 P	6 A	8:30 A	.05	
3	66.0	.716	90.5	S.	80	0.0	—	—	3 P	3:30 P	T	
4	65.5	.708	88.0	S.	239	8.5	41	6 P	7 A	12 P	1.72	
5	50.5	.661	55.5	W.	202	1.5	17	11 A	0 A	0:30 A	.03	
6	49.5	.625	63.5	W.N.W.	188	3.5	26	12 M				
7	56.0	.695	65.0	N.N.W.	108	0.5	10	12 M				
8	50.0	.633	57.5	S.W.	67	0.0	—	—				
9	60.5	.673	78.0	S.S.E.	96	0.0	—	—				
10	59.5	.592	86.0	S.	110	0.0	—	—	2 P	12 P	1.02	
11	58.5	.668	75.0	N.N.W.	108	0.0	—	—	0 A	2 A	.22	
12	61.0	.675	81.5	N.	67	0.5	10	1 P				
13	56.0	.644	71.0	S.W.	110	0.5	10	12 M				
14	60.5	.720	75.0	S.	134	0.0	—	—				
15	66.5	.707	92.5	S.S.W.	144	2.0	20	4 P				
16	60.5	.680	78.0	E.	109	0.5	10	8 A				
17	54.0	.625	67.5	E.S.E.	145	0 5	10	2 P				
18	56.0	.535	86.0	S.S.W.	135	0.5	10	2 P	9 P	12 P	.11	
19	55.0	.605	73.5	W.N.W.	225	2.5	22	10 A	0 A	8 A	.88	
20	53.5	.544	76.0	N.N.E.	73	0.0	—	—				
21	52.5	.545	75.5	E.S.E.	94	1.0	14	5 P				
22	57.5	.650	73.5	S.S.W.	190	2.0	20	2 P				
23	61.5	.670	82.5	S.	157	0.5	10	4 P				
24	66.5	.729	89.0	S.	173	0.5	10	2 P				
25	66.0	.816	86.5	S.S.W.	237	1.5	17	2 P				
26	60.5	.713	75.5	S.W.	260	3.0	24	3 P	8 A		T	
27	49.0	.477	73.0	W.	61	0.0	—	—				
28	50.5	.511	75.0	N.W.	76	0.0	—	—				
29	56.5	.576	82.5	W.	77	0 0	—	—				
30	49.5	.555	62.5	E.S.E	119	0.0	—	—				
31	55.0	.589	74.5	S.S.W	237	2.5	22	11 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during August presented no marked variations from normal conditions although somewhat more pleasant than usual for this period. This was due to the fact that there were but few days when the maximum temperature became oppressive. More than the usual amount of wind was from the south points and the total wind movement was rather large.

Comparing the records of the several weather elements with the mormal values for this station the following features are noted: The mean barometer was higher than any previous August here and the range was rather large. The maximum and minimum were both lower than the normal values for this month.

The mean temperature was slightly lower than the normal and the maximum and minimum for the month were both below average values, while the range was rather small.

The mean due point and relative humidity were both below the normals.

The total precipitation was slightly less than the average and nearly the whole amount fell in three well defined storms.

The total wind movement was nearly 40 per cent more than the normal, although but one moderate gale was recorded.

The amount of sunshine was practically normal and nearly all the days were either clear or fair. The number of days showing precipitation was small.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Acting Observer.

BULLETIN No. 261. SEPTEMBER, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.05, 16th, 10 A.
Minimum reduced to freezing,	29.49, 9th, 12 M.
Reduced† maximum reading,	30.34, 16th, 10 A.
Reduced† minimum reading,	29.77, 9th, 12 M.
Mean semi-daily reduced,	30.100
Monthly range,	0.57

****Air Temperature.*** In Degrees Fahr.

Highest,	82.0, 13th, 4 P.
Lowest,	34.0, 23d, 7 A.
Mean hourly,	61.1
Mean of means of max. and min.,	61.7
Mean sensible (wet bulb),	55.6
Monthly range,	48.0
Highest mean daily,	71.4, 5th
Lowest mean daily,	52.4, 23d
Mean maximum,	73.4
Mean minimum,	50.1
Mean daily range,	23.3
Greatest daily range,	36.5, 18th
Least daily range,	6.5, 1st

Humidity.

Mean dew point,	53.5
Mean force of vapor,	.510
Mean relative humidity,	82.7

Precipitation. In inches.

Total precipitation,	2.86
Number of days on which .01 inch or more rain fell,	11

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	3336m.
Greatest daily movement,	204m., 14th.
Least daily movement,	38m., 27th.
Mean daily movement,	111.2 m.
Mean hourly velocity,	4.7 m.

Maximum pressure per square foot, 2.5 lbs.= 22m. per hour, 6th, 5P., S. S. E.

Maximum velocity for 5 minutes, 18m. per hour 23d, 3P., S.S.W.

Prevailing Direction, West Southwest.

Summary.

North Northeast	13 per cent.
North	13 " "
North Northwest	10 " "
South Southwest	20 " "
West Southwest	13 " "
South Southeast	10 " "
Other directions	21 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	128 hrs.=34 per cent.
Number of clear days,	14
Number of fair days,	9
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, . . 245 hrs.=66%

Rain, 1st, 2d, 3d, 4th, 5th, 6th, 9th, 13th, 14th, 21st, 24th, 25th, 27th, 28th.

Gales, 35 or more miles per hour: None.

Thunder and Lightning, 5th, 6th, 13th.

Light Frost, 23d.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.12	29 99	30.030	69.0	12 M	62.5	0 A	65 7	65.7	64.0	0 8
2	30.15	30 03	30.111	78.0	4 P	55 0	12 P	66.5	64.9	54.5	11.5
3	30.15	29.79	29.929	69.0	12 M	51.0	7 A	60.0	59.3	57.5	4.7
4	29.95	29.79	29.898	80.0	4:30 P	58.5	4 A	69.3	68.0	64.7	8.0
5	29.98	29.87	29.924	76.0	6 P	68.0	5 A	72.0	71.4	70.7	1.9
6	30.00	29.89	29.948	80.0	5 P	65.0	6:30 A	72.5	67 7	65.5	0.0
7	30.12	29.89	30.008	80.0	2 P	61.0	12 P	70.5	70.5	64.0	11.7
8	30.15	29.97	30.068	76.5	4 P	53.0	6 A	64.7	65.1	60.0	11.7
9	30.09	29.77	29.875	76.5	3 P	55.0	12 P	65.7	66.5	59 3	8.3
10	30.28	30.09	30.246	71.0	5 P	41 0	7 A	56.0	56.1	50.5	11.8
11	30.33	30.24	30.294	73.0	2 P	45 0	6 A	59.0	57.5	51.5	10.0
12	30.32	30.15	30.252	79.0	3 P	45.5	6 A	62.3	61.8	54 5	11.0
13	30.19	30.03	30.108	82.0	4 P	51.0	6 A	66.5	65 9	61.3	10.0
14	30.24	30.08	30.175	67.0	5 P	49.0	12 P	58.0	59 4	52.0	10.7
15	30.28	30.19	30.260	74.0	4 P	42.0	7 A	58.0	56.4	49 5	11.7
16	30.34	30.26	30.305	71.5	3 P	41.0	6 A	56.3	55.5	50.3	11.0
17	30.27	30.02	30.129	72.0	3 P	43 0	7 A	57.5	57.1	51.7	11.0
18	30.07	29.95	30.018	78.5	2 P	42.0	7 A	60.3	61.3	55.5	9 2
19	30.17	29.95	30.090	64.5	0 A	48.5	12 P	56.5	54.4	48 5	1.7
20	29.95	29.82	29.867	73.0	4 P	46.5	5 A	59.7	57.7	47.7	8.8
21	30.04	29.84	29.913	76.0	3 P	53.0	12 P	64.5	63.6	56 0	9.5
22	30.30	30.04	30.236	70.0	5 P	41.5	12 P	55.7	54.2	46.5	11.7
23	30.32	30.19	30.269	69.0	4 P	34.0	7 A	51.5	52.4	46.0	9.2
24	30.28	30.24	30.270	63.5	12 M	53.5	6 A	58.5	57.3	54.7	1.0
25	30.26	30.06	30.146	77.5	2 P	54.5	0 A	66.0	64.4	59.7	7.2
26	30.09	30.02	30.065	78.0	3 P	58.0	12 P	68.0	67.0	61.7	8.8
27	30.14	29 99	30.081	65.0	12 P	58.0	5 A	61.5	61.1	59 7	1.3
28	30.15	29.97	30.076	71.0	3 P	48.0	12 P	59.5	62.5	54.3	9.3
29	30.27	30.15	30.248	71.0	5 P	41.0	6 A	56.0	54.3	48.3	11.4
30	30.26	30.00	30.150	70.0	3 P	39.0	7 A	54.5	54.0	47.7	9.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	63.5	.623	93.5	S.	83	0.0	—	—	8:30 A	12 P	.06	
2	48.5	.555	61.5	S.S.E.	151	2.0	20	8 A	0 A	2 A	T	
3	56.0	.508	88 5	S.S.W.	145	1.0	14	12 M	12 M	11 P	.79	
4	64.0	.657	91.5	S.S.W.	77	0.0	—	—	11 P	12 P	.09	
5	71.0	.772	96.5	S.W.	44	0.0	—	—	0 A	10 P	.67	
6	64 5	.657	94 0	S.S.E	87	2.5	22	5 P	0 A	12 P	.67	
7	66.0	.720	75.5	N.W.	153	1.0	14	8 A				
8	57.0	.600	78.0	S.S.W.	74	0.0	—	—				
9	56.5	.578	80.0	W.S.W.	198	2.0	20	2 P	4 A	5 A	.02	
10	47.5	.413	80.5	W.S.W.	77	1.0	14	2 P				
11	52.5	.413	89.5	W.S.W.	55	0.0	—	—				
12	52.0	.492	80.5	S.	97	0 0	—	—				
13	60.0	.605	85.5	S.S.W.	109	0.0	—	—	8 P	10 P	.01	
14	48.5	.442	79.5	N.	204	2.0	20	9 A	1 P	—	T	
15	45.0	.410	75.5	N.	106	0.5	10	12 M				
16	48.0	.390	87.5	N.N.E.	85	0.5	10	2 P				
17	48.5	.444	76.5	N.N.E.	128	2.0	20	2 P				
18	51.5	.530	74.0	N.N.W.	74	1.0	14	11 P				
19	45.0	.384	79.5	N.N.E.	184	1.0	14	3 A				
20	51.0	.437	86.5	W.S.W.	85	0.0	—	—				
21	53.5	.522	81.0	N.N.W.	120	1.0	14	12 M	1 A	2 A	.01	
22	42.5	.368	74.5	N.	112	0.5	10	8 A				
23	44.0	.364	85.0	S.S.W.	144	2.0	20	12 M				
24	53.0	.446	89.5	E.S.E.	81	0.0	—	—	2 P	12 P	.33	
25	58.0	.563	87.0	S.S.W.	159	1.5	17	2 P	9 P	10 P	T	
26	60.0	.600	87.0	W.	99	0.0	—	—				
27	57.0	.537	88 0	N.N.E.	38	0.5	10	7 A	8 A	12 P	.19	
28	51.0	.490	76.0	N.N.W.	177	1.0	14	3 P	0 A	6 A	.02	
29	43.5	.398	72.5	N.	78	1.5	17	9 A				
30	45.5	.370	86.5	S.S.E.	112	1.0	14	4 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was generally pleasant, and the fluctuations in pressure and temperature were considerably smaller than usual. Usually one of the most enjoyable seasons of the year, the past month was fully up to expectations, and left but little to be desired.

Several of the features are deserving of passing notice, however, and attention is called to those following: The barometer was above the normal, and September has the highest normal of any month of the year. The range was the smallest September range on the records of this station. The changes in pressure being generally small and slow, there were no gales recorded, and the maximum wind velocity was very small.

The maximum temperature was nearly six degrees below the normal and the minimum slightly above the normal, giving the smallest range for September on our records here. The greatest daily range, however, was large.

The mean dew point was slightly lower than usual, and the relative humidity five per cent above the normal; a record rather unexpected on account of the small precipitation.

The total precipitation was about seventy per cent of the normal, and most of it occurred early in the month. At the close of the month droughty conditions prevailed.

The total wind movement was normal, and on many dates practically no pressure was recorded. The amount of sunshine was considerably above the average.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 262. OCTOBER, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 17, 8th, 8 A.
Minimum reduced to freezing,	29.13, 27th, 4 P.
Reduced† maximum reading,	30.47, 8th, 8 A.
Reduced† minimum reading,	29.42, 27th, 4 P.
Mean semi-daily reduced,	30.006
Monthly range,	1.05

****Air Temperature.*** In Degrees Fahr.

Highest,	84.0, 5th, 1 P.
Lowest,	19.0, 31st, 7 A.
Mean hourly,	51.7
Mean of means of max. and min.,	52.3
Mean sensible (wet bulb),	45.6
Monthly range,	65.0
Highest mean daily,	72.0, 5th
Lowest mean daily,	32.5, 30th
Mean maximum,	64.5
Mean minimum,	40.0
Mean daily range,	24.5
Greatest daily range,	38.0, 18th
Least daily range,	7.0, 15th

Humidity.

Mean dew point,	41.2
Mean force of vapor,	.375
Mean relative humidity,	75.0

Precipitation. In inches.

Total precipitation,	0.93
Number of days on which .01 inch or more rain fell,	7

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5467m.
Greatest daily movement,	352m., 6th.
Least daily movement,	33m., 31st.
Mean daily movement,	176.0 m.
Mean hourly velocity,	7.3 m.
Maximum pressure per square foot,	8.0 lbs.= 40m. per hour, 2d, 1A., N.W.
Maximum velocity for 5 minutes,	36m. per hour 27th, 7P., W.S.W.
Prevailing Direction,	West.

Summary.

West Northwest	13 per cent.
South Southwest	19 " "
North Northwest	13 " "
Southwest	13 " "
Northwest	10 " "
North	10 " "
Other directions	22 " "

Weather.

Mean cloudiness observed,	44 per cent.
Total cloudiness recorded by the Sun Thermometer,	112 hrs.=33 per cent.
Number of clear days,	12
Number of fair days,	14
Number of cloudy days,	5

Bright Sunshine.

Number of hours recorded,	229 hrs.= 67%

Rain, 7th, 9th, 14th, 15th, 22d, 23d, 25th, 27th, 28th.

Snow, 27th.

Frosts, 13th, 29th, 30th, 31st.

Thunder and Lightning, 9th, 25th.

Gales, 35 or more miles per hour: 40m, 2d, 1 A, N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.00	29.48	29.696	77.0	3 P	53.5	5 A	65.3	63.7	56.3	8.3
2	30.30	29 64	30.068	63.0	4 P	42.0	10 P	52.5	53.2	42.0	11.4
3	30.46	30.30	30.431	67.0	4 P	42.5	0 A	54.7	53.4	47.3	9.5
4	30.43	30.24	30.300	75.0	4 P	49.0	2 A	62.0	62.7	59.3	6.7
5	30.24	30.10	30.152	84.0	1 P	65.0	0 A	74.5	72.0	65.5	6.8
6	30.11	29.88	29.958	82.0	2:30 P	63.5	6 A	72.7	71 9	66.7	9.5
7	30.40	29.91	30.216	71.5	2 A	46.5	12 P	59.0	55.5	51.7	0.0
8	30.47	30.16	30.353	59.0	1 P	37.0	7 A	48.0	48.6	42.3	9.0
9	30.16	29.77	29.889	62.0	2 P	37.0	3 A	49.5	47.2	44.3	5.8
10	29.98	29.85	29.962	61.0	3 P	41.5	12 P	51.3	49.8	43.7	8.9
11	29.92	29.75	29.796	71.0	3 P	40.0	1 A	55.5	58.1	51.7	10.4
12	30.23	29.72	30.007	61.0	0 A	34.0	12 P	47.5	50.8	40 3	9.5
13	30.38	30.23	30.324	59.0	4 P	29.0	6 A	44.0	42.0	37.0	10.3
14	30.25	29.94	30.082	74.0	3 P	39.0	0 A	56.5	57.7	53.0	8.5
15	30.18	29.89	30.080	57.0	0 A	50.0	11 P	53.5	52.1	47.7	0.0
16	29.92	29.67	29.804	73.0	1 P	45.0	12 P	59.0	58.4	50.0	8.3
17	30.07	29.92	30.028	72.5	2 P	35 0	7 A	53.7	52.6	43.7	10.5
18	30.17	30.05	30.126	73.5	4 P	35.5	6:30 A	54.5	55.0	47.0	10.0
19	30.12	29 99	30.064	78.0	2 P	46.0	6 A	62.0	61.1	55.3	8.3
20	29.99	29.75	29.818	74.0	4 P	57.5	12 P	65.7	62.8	59.5	5.2
21	30.12	29 87	30.098	61 0	4 P	33.0	12 P	47.0	49.4	40.3	7.7
22	30.11	29.69	29.858	48.5	10 A	33.0	0 A	40.7	42 5	41.5	0.0
23	29.86	29.63	29.740	54.5	12 M	44.0	6 A	49.3	47.1	40.5	7.5
24	29.96	29.81	29.911	59.5	2 P	34.5	6 A	47.0	46.4	40.3	9.3
25	29.81	29.45	29.576	59.0	2 P	38.0	7 A	48.5	48 6	44.0	4.2
26	29.82	29.49	29.676	54.0	3 P	34 5	12 P	44 3	45.4	37 5	10.0
27	29.82	29.42	29.618	65.0	7 P	34.5	0 A	49.7	47 6	44.0	2.5
28	29.85	29.59	29.776	54.5	3 P	36.0	12 P	45.3	45.7	39.0	5.3
29	30.16	29.87	30.062	50.0	1 P	24.0	7 A	37.0	35.1	28.3	6.7
30	30.29	30.16	30.348	46.0	3 P	22.0	7 A	34.0	32.5	26.7	10.0
31	30.38	30.25	30.354	54 0	3 P	19 0	7 A	36.5	33.3	26.3	9.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	52.5	.544	74.5	W.N.W.	312	4.5	30	10 P				
2	36.0	.328	65.0	N.N.W.	318	8.0	40	1 A				
3	43.0	.380	74.5	S.S.W.	116	0.5	10	7 P				
4	57.0	.575	81.5	S.S.W.	265	3.5	26	12 M				
5	63.0	.712	82.0	S.S.W.	301	2.0	20	12 M				
6	65.0	.722	86 5	S.	352	3.5	26	1 P				
7	50.0	.412	90.0	N.	259	2.0	20	10 A	6 A	4 P	.34	
8	37.5	.315	72.0	E.S.E.	137	0.5	10	11 A				
9	43.5	.300	94.0	W.S.W.	57	1.5	17	2 P	8A	9 P	.15	
10	39.5	.326	75.5	N.W.	177	1.5	17	11 A				
11	44.5	.504	59.5	W.N.W.	181	3.5	26	2 P				
12	32.0	.330	55.5	N.	271	3 5	26	12 M				
13	29.5	.265	62.5	W.N.W.	106	0.5	10	8 A				
14	49.0	.490	72.0	S.S.W.	216	1.0	14	3 A	8 P	—	T	
15	44.5	.367	81.5	S.S.E	77	0.5	10	11 A	12 M	3 P	.02	
16	44.5	.435	69.5	N.W.	195	4.0	28	10 A				
17	38.0	.338	68.0	N.N.W.	78	0.0	—	—				
18	42.5	.408	70.5	S.S.W.	115	0.5	10	4 P				
19	54.0	.476	91.0	S.S.W.	222	2.0	20	2 P				
20	58.5	.531	94.0	N.N.W.	98	2.0	20	10 P				
21	33.5	.300	65.5	N.E.	273	4.0	28	2 P				
22	39.5	.279	88.0	S.W.	54	0.0	—	—	12 M	12 P	.29	
23	33.0	.312	60.0	W.N.W.	219	3.5	26	5 P	0 A	3 A	.03	
24	33.5	.299	66.0	S.W.	144	0.5	10	3 A				
25	40.5	.327	81.5	W.S.W.	86	0.5	10	10 P	2 P	8 P	T	
26	30.5	.270	63.5	N W.	338	5.0	32	10 A				
27	41.5	.322	85.0	W.	134	5.0	32	7 P	5 P	12 P	.07	T
28	34.0	.273	73 0	S.W.	135	0.0	—	—	0 A	6 P	.03	
29	25.0	.167	83.0	N.	97	0.5	10	3 P				
30	18 5	.170	62.0	N.N.W.	101	0.0	—	—				
31	22 5	.160	77.5	S.W.	33	0 0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was in general a continuation of the unusually pleasant weather of the preceding month, and was marked by the same characteristics. The small precipitation was the most noticeable feature, while a large wind movement and much sunshine were other features of interest.

An analysis of the records shows the following as the principal characteristics: The mean barometer was below the normal and the range slightly less than the average value. The fluctuations in pressure were, as a rule, rather large and extended over considerable periods. The large fluctuations in pressure produced a total wind movement which was fully one-third more than the normal, and gave a number of high daily records.

The mean temperature was about three degrees above the normal; the maximum was nearly five degrees higher, and the minimum about three degrees lower than the normal values for this month, giving an unusually large range. The 5th and 6th were unusually warm days for October.

The mean dew point and relative humidity were both practically normal.

The total precipitation was only about one-fourth the mean. The rain storms were all small, so there was practically no runoff to replenish the reservoirs, already low from the drought of the previous month. The precipitation record was the smallest for October since 1897.

The amount of sunshine was unusually large, and but five cloudy days were noted.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 263. NOVEMBER, 1910

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.09, 1st, 8 A.
Minimum reduced to freezing,	29.07, 30th, 12 P.
Reduced† maximum reading,	30.40, 1st, 8 A.
Reduced† minimum reading,	29.38, 30th, 12 P.
Mean semi-daily reduced,	29.799
Monthly range,	1.02

****Air Temperature.*** In Degrees Fahr.

Highest,	61.0, 2d, 1 P.
Lowest,	15.0, 21st, 7 A.
Mean hourly,	36.4
Mean of means of max. and min.,	37.1
Mean sensible (wet bulb),	32.5
Monthly range,	46.0
Highest mean daily,	47.0, 2d, 5th
Lowest mean daily,	28.4, 20th
Mean maximum,	44.2
Mean minimum,	29.9
Mean daily range,	14.3
Greatest daily range,	34.5, 1st
Least daily range,	3.5, 29th

Humidity.

Mean dew point,	28.2
Mean force of vapor,	.205
Mean relative humidity,	78.7

Precipitation. In inches.

Total precipitation,	3.69
Number of days on which .01 inch or more rain fell,	8
Total snow in inches	4

*Temperature in ground shelter.

† Reduced to freezing and sea-level.

Wind.

Total movement,	5215m.
Greatest daily movement,	468m., 27th.
Least daily movement,	47m., 1st.
Mean daily movement,	174.0 m.
Mean hourly velocity,	7.2 m.

Maximum pressure per square foot, 7.5 lbs.= 39m. per hour, 27th, 11 A., N.

Maximum velocity for 5 minutes, 30m. per hour 27th, 11 A., N.

Prevailing Direction, Northwest.

Summary.

North	23 per cent.
West Northwest	20 " "
Northwest	10 " "
North Northwest	10 " "
South Southwest	10 " "
Other directions	27 " "

Weather.

Mean cloudiness observed,	68 per cent.
Total cloudiness recorded by the Sun Thermometer,	156 hrs.=53 per cent.
Number of clear days,	5
Number of fair days,	15
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, . . 137 hrs.=47%

Rain, 2d, 3d, 4th, 9th, 10th, 11th, 22d, 25th.

Snow 8th, 11th, 12th, 15th, 25th, 29th, 30th.

Gales, 35 or more miles per hour: 36m, 4th, N.; 39m, 27th, N.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.40	30.25	30.340	59.0	3 P	24.5	7 A	41.7	40.2	33.3	8.2
2	30.25	30 06	30.134	61.0	1 P	31.0	6 A	46.0	47.0	41.7	3.3
3	30.08	29 83	29.983	49.0	0 A	39.5	10 A	44.3	42.3	39.0	0.0
4	29.83	29 65	29.734	45.5	12 P	40 0	0 A	42.7	43.5	42.3	0 0
5	29.75	29.66	29.736	57.0	2 P	41.5	12 P	49.3	47.0	42.5	4.1
6	29.74	29.68	29.728	48.0	12 M	37.0	12 P	42.5	41.6	37.3	5.0
7	29.72	29 62	29.692	44.0	1 P	28.5	7 A	36.3	35.1	29.5	7.0
8	29 81	29 63	29.727	34.0	4 P	25.0	6 A	29.5	31.3	27.5	0.1
9	29.90	29.81	29.896	45.0	3 P	32.5	2 A	38.7	37.5	34 7	4.7
10	29.85	29 47	29.616	50.0	3 P	36.5	3 A	43.3	41.9	39.0	5.0
11	29.61	29.52	29.592	45.0	11 A	29.0	12 P	37 0	38 8	32.5	5.1
12	29 60	29.48	29.564	42 0	2 P	26 0	3 A	34.0	31 6	29.0	6.2
13	29 60	29.51	29 565	38 5	1 P	24 5	5 A	31.5	30.5	27.7	4.1
14	29.63	29 54	29.617	43.5	1 P	26.0	7 A	34.7	33.0	30.3	6.5
15	29 70	29.57	29.659	42.0	1 P	26.0	7 A	34 0	33.0	29.5	4.7
16	29.68	29.63	29.672	40.5	1 P	29.0	5 A	34.7	34.2	29.5	5.0
17	29.75	29.65	29.724	39.0	2 P	28 0	12 P	33 5	33.5	28.3	3.5
18	29.85	29.75	29 830	45.0	2 P	26.5	1 A	35.7	35.1	31.3	8.1
19	30.15	29.85	30.031	40.0	2 P	24.0	12 P	32.0	33.0	28.7	6.7
20	30.23	30.15	30.214	40.0	3 P	20.5	7 A	30.3	28.4	23.0	9.2
21	30.20	29 97	30.096	42.0	3 P	15 0	7 A	28.5	29.7	25.7	6.7
22	29.97	29.86	29 921	40.0	2 P	33 5	7 A	36.7	35.7	33.7	1.8
23	30.10	29.97	30.049	46.0	3 P	32 0	7 A	39.0	37.9	33 7	8.1
24	30.00	29.77	29 847	52.0	2 P	34.0	12 P	43.0	42.2	34 0	6.5
25	29.77	29.60	29.662	38.0	4 P	31.5	5 A	34.7	34.1	32.7	0.0
26	29.84	29.66	29.791	43.0	12 M	30.0	7 A	36 5	36 4	31.5	6.5
27	29.87	29.76	29.854	45.0	2 P	31 0	12 P	38.0	36.4	30.7	8.5
28	29.82	29.63	29.749	40.0	2 P	31.0	0 A	35 5	34.9	31.5	2.7
29	28.63	29.48	29.525	36.0	4 P	32 5	6 A	34.3	33.2	32.0	0.0
30	29.49	29.38	29.426	36.5	2 P	31.0	8 A	33.7	33.6	31.5	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	27.0	.220	73.0	E.N.E.	47	0.0	—	—				
2	36.0	.290	87.5	S.S.W.	140	2.0	20	12 M	4 P	12 P	.44	
3	36.5	.254	86.0	N.	200	2.5	22	6 P	0 A	12 P	.73	
4	41.0	.282	90.5	N.	366	6.5	36	5 P	0 A	12 P	1.01	
5	40.0	.298	83.5	N.N.W.	227	2.0	20	0 A				
6	33.0	.250	76.0	W.	167	2.5	22	10 P				
7	23.0	.184	70.0	W.N.W.	189	3.5	26	12 M				
8	21.5	.171	70 5	S.W.	122	0.0	—	—	9 A	11 A	T	T
9	31.0	.221	78.5	W.S.W.	230	2.0	20	12 M	7 P	12 P	.06	
10	38.5	.244	94.0	N.	61	0.0	—	—	0 A	4 P	.16	
11	27.5	.204	75.0	N.W.	135	0.5	10	1 P	11 A	6 P	T	T
12	25.5	.171	82.5	W.S.W.	131	0.5	10	12 M	8 A	10 A	T	T
13	24.0	.163	81.0	S.S.W.	137	1.0	14	12 M				
14	27.5	.181	82.5	W.N.W.	84	0.0	—	2 P				
15	26.0	.178	81.5	N.W.	106	1.0	14	12 M	7 A	9 A	T	T
16	21.0	.193	60.0	N W.	269	3.0	24	12 M				
17	21.0	.178	64.5	W.N.W.	273	2.5	22	2 P				
18	25.5	.198	70.0	W.N.W.	175	2.0	20	11 A				
19	25.0	.173	79.5	W.N.W.	195	3.0	24	12 M				
20	18.0	.137	73.0	N.N.W.	209	1.5	17	10 A				
21	21.5	.158	81.0	S.S.W.	84	0.5	10	2 P				
22	31.5	.202	88.5	N.N.E.	106	1.0	14	12 P	1 A	10 A	.13	
23	30.0	.209	81.5	N.	177	1.0	14	0 A				
24	30.5	.215	78.0	W.	115	1 0	14	4 P				
25	31.0	.191	92.5	N.N.W.	90	0.5	10	1 P	6 A	2 P	.17	T
26	22.5	.210	59.5	N.	319	5.5	33	8 P		.		
27	23.5	.199	65.0	N.	468	7.5	39	11 A				
28	26.5	.199	72.0	N.N.E.	164	0.5	10	5 P				
29	30.0	.186	92.5	N.	119	0.0	—	—	2 A	12 P	.99	4
30	30.0	.184	90.5	W.N.W.	110	0.5	32	3 P	0 A	10 P	T	T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was in general seasonable, and the transition to the winter season was about completed. Excepting a rather large wind movement and an extremely low mean barometer, the records of the various weather elements were not far from the normals.

The most marked departure from normal conditions was the mean barometer for the month. The mean was nearly one-fourth of an inch below the November normal, and .16 of an inch below any former November mean on our records. The only lower monthly means on the records here are for Feb., 1901, when the mean was 29.79, and Feb., 1902, when the mean was 29.78; the latter being our lowest record.

The maximum pressure was very low, while the minimum pressure was considerably above the average minimum, giving an unusually small range for the time of year. Although the total wind movement was 20 per cent more than usual, the changes in pressure were generally small and slow.

The mean temperature was practically normal, while the maximum was low and the minimum high, giving a considerably smaller range than usual.

The mean dew point was about 2½ degrees below the normal, and the relative humidity rather high.

The total precipitation was a little above the average, and did much to relieve the droughty condition which existed at the beginning of the month.

The daily wind movement on several dates was rather large, although but two gales were noted.

The sunshine record was not far from normal.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 264. DECEMBER, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.45, 31st, 10 A.
Minimum reduced to freezing, 29.03, 15th, 6 P.; 20th, 2 P.
Reduced† maximum reading, 30.78, 31st, 10 A.
Reduced† minimum reading, 29.34, 15th, 6P.; 20th, 2 P.
Mean semi-daily reduced, ... 30.030
Monthly range, ... 1.44

***Air Temperature.** In Degrees Fahr.

Highest, ... 47.0, 24th, 9A.
Lowest, ... -2.0, 10th, 7:30 A.
Mean hourly, ... 21.7
Mean of means of max. and min., ... 21.9
Mean sensible (wet bulb), ... 18.7
Monthly range, ... 49.0
Highest mean daily, ... 37.7, 24th
Lowest mean daily, ... 5.6, 16th
Mean maximum, ... 35.8
Mean minimum, ... 13.1
Mean daily range, ... 22.7
Greatest daily range, ... 38.5, 30th
Least daily range, ... 5.5, 6th

Humidity.

Mean dew point, ... 14.2
Mean force of vapor, ...119
Mean relative humidity, ... 78.4

Precipitation. In inches.

Total precipitation, ... 1.72
Number of days on which .01 inch or more rain fell, ... 7
Total snow in inches 2.5

*Temperature in ground shelter.
†Reduced to freezing and sea-level.

Wind.

Total movement, ... 5435m
Greatest daily movement, ... 407m., 30th
Least daily movement, . . . 48m., 27th, 28th
Mean daily movement, ... 175.0 m
Mean hourly velocity, ... 7.3 m
Maximum pressure per square foot, 10.5 lbs.= 46m. per hour, 15th, 8 P., N.
Maximum velocity for 5 minutes, 42m. per hour 30th, 4 P., N.W.
Prevailing Direction, Northwest.

Summary.

Northwest . . . . . 26 per cent.
North Northwest . . . . . 16 " "
North . . . . . 10 " "
West Northwest . . . . . 10 " "
West . . . . . 13 " "
Other directions . . . . . 25 " "

Weather.

Mean cloudiness observed, ... 55 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 127 hrs.=45 per cent.
Number of clear days, ... 8
Number of fair days, ... 13
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . 156 hrs.=55%

Rain, 18th, 19th, 23d, 24th, 29th, 30th.

Snow, 11th, 15th, 18th, 19th, 20th, 21st, 26th, 28th.

Days Sleighing, None.

Gales, 35 or more miles per hour: 46m, 15th, N..; 36m, 16th, N.N.W.; 37m, 24th, S.S.W.; 45m, 30th, N. W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.59	29.37	29.470	36.5	1 P	25.0	12 P	30.7	31.6	27.0	7.5
2	29.95	29.59	29.828	31.0	2 P	18.5	12 P	24.7	24.4	19.7	8.5
3	30.09	29.95	30.072	34.5	2 P	11.5	7 A	23.0	21.6	16.3	8.2
4	30.08	29.98	30.054	32.5	2 P	14.5	3 A	23.5	24.8	23.3	6.0
5	30.16	30.05	30.114	25.0	0 A	13.0	8 A	19.0	18.2	14.0	7.5
6	30.05	29.82	29.916	16.5	9 P	11.0	6 A	13.7	13 3	12.0	1.1
7	29.95	29.80	29.896	34.5	3:30 P	14.0	3 A	24.3	19.3	15.5	8.3
8	30.04	29 95	30.016	33.0	2 P	13.5	6 A	23.3	21.8	17.5	6.7
9	30.26	30.04	30.204	22.5	2 A	8.0	12 P	15.3	16.0	10.5	8.3
10	30.31	30.16	30.252	23.5	2 P	−2.0	7:30 A	10.7	9.0	3.7	8.3
11	30.16	30.09	30.130	16.0	3 P	3.5	0 A	9.7	10.4	9.3	0.0
12	30.26	30.11	30.203	28.0	3 P	8.0	4 A	18.0	18.2	16.5	5.3
13	30.40	30.26	30.370	28.0	1 P	8.0	7 A	18.0	17.2	13.0	7.2
14	30.28	29.72	29.931	35.0	12 P	16.0	0 A	25.5	26.6	26.0	0.5
15	29.77	29.34	29.536	36.0	0:30 A	7.0	12 P	21.5	27.8	23.0	0.0
16	30.32	29.77	30.182	14.0	4 P	0.5	7 A	7.3	5.6	3.0	8.3
17	30.37	30.27	30.337	22.0	3 P	4.0	0 A	13.0	13.7	13.0	5.0
18	30.32	29.78	30.150	34.0	2 P	17.0	1 A	25.5	25.3	24.3	6.0
19	29.78	29.42	29.472	40.5	3 P	29.0	1 A	34.7	32.2	29.0	5.8
20	29.42	29.34	29.403	34.0	1:30 P	22.0	7:30 A	28.0	28.1	26.0	1.5
21	30.01	29.41	29.679	25.5	0 A	12 0	12 P	18.7	19.1	15.5	5.3
22	30.47	30.01	30.384	27.5	4 P	7.5	7:30 A	17.5	15.2	10.5	8.4
23	30.47	30.11	30.336	34.5	11 P	6.5	7 A	20.5	21.2	18.3	5.5
24	30.11	29.74	29.815	47.0	9 A	32.0	12 P	39.5	37.7	39.0	0.0
25	30.26	29.84	30.134	32.0	1 A	16.0	12 P	24.0	26.5	22.7	5.5
26	30.29	30.10	30.207	24 5	12 P	11.0	7:30 A	17.7	16.8	15.3	0.0
27	30.19	30.09	30.161	35.0	4 P	23.0	10 P	29.0	26.7	24.0	4.9
28	30.24	29.95	30.132	36.0	12 P	14.5	7 A	25.3	25.9	24.5	3.2
29	30.00	29.68	29.888	41.0	12 P	33.5	7:30 A	37.3	37.2	35.5	2.2
30	30.44	29.48	29.922	46.0	4:30 A	7.5	12 P	26.7	30.5	23.5	2.8
31	30.78	30.44	30.740	22.0	3:30 P	2.0	7:30 A	12.0	11.0	8.0	8.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	22.5	.160	78.5	N.W.	161	0.5	10	12 M				
2	13.5	.121	67.5	N.W.	162	0.5	10	1 P				
3	14.0	.098	84.5	N.W.	82	3.0	24	6 P				
4	19.5	.136	81.0	W.	103	4 0	28	9 A				
5	8.5	.092	72.5	N.N.W.	147	1.0	14	12 P				
6	7.0	.083	74.5	N.	332	3.5	26	3 A				
7	9.0	.098	69.5	N.N.W.	253	3.0	24	4 A				
8	12.0	.108	75.0	W.S.W.	171	1.0	14	4 P				
9	0.0	.080	59.0	W.N.W.	220	3.0	24	1 P				
10	−4.0	.058	70.0	N.N.W.	70	0.0	—	—				
11	4.0	.073	75.5	N.N.E.	191	1 5	17	4 A	12 M	3 P	T	T
12	12.0	.101	78.5	N.	178	1.0	14	4 A				
13	7.5	.089	73.0	N.W.	183	2.0	20	2 P				
14	23.5	.151	86.5	S.W.	192	0.5	10	10 P				
15	20.5	.134	87.0	N.W.	246	10.5	46	8 P	2 P	8 P	T	½
16	−0 5	.054	82.5	N.N.W.	303	6.5	36	1 A				
17	10.5	.086	86.0	W.S.W.	137	1.5	17	3 P				
18	22.0	.138	90.5	S.	140	0.0	—	—	11 P	12 P	T	T
19	25.0	.174	79.5	N.	83	0.0	—	—	0 A	8 A	.12	T
20	25.0	.146	93.5	W.	96	0.0	—	—	8 P	12 P	.01	½
21	9.5	.097	72.0	N.W.	287	5.5	33	9 P	2 P	8 P	T	T
22	5.5	.078	72.5	N.N.W.	217	2.5	22	1 A				
23	14.5	.120	79.0	S.S.E.	112	0.5	10	4 P	6 P	12 P	T	T
24	36.5	.257	86.0	N.W.	208	7.0	37	8 A	0 A	4 P	1.34	T
25	17.5	.137	73.0	N.W.	316	3.0	24	10 A				
26	12.5	.096	83.5	W.	80	0.5	10	7 A	2 P	9 P	.06	½
27	22.5	.134	90.5	W.N.W.	48	0.0	—	—				
28	23.0	.143	93.0	E.S.E.	48	0 0	—	—	2 P	8 P	.10	1
29	34.0	.213	93.5	S.S.W.	66	0.5	10	9 P	5 P	6 P	.01	
30	14.0	.157	60.5	W.N.W.	407	10.0	45	2 P	2 A	5 A	.08	
31	-0.5	.072	63.0	W.	196	3.0	24	1 A				

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1910.

Pressure. In inches.

Maximum reduced to freezing, ... 30.53, Jan. 4th, 11 P.
Minimum reduced to freezing, ... 28.80, Jan. 29th, 5 P.
Maximum reduced to freezing and sea-level, ... 30.87, Jan. 4th, 11 P.
Minimum reduced to freezing and sea-level, ... 29.11, Jan. 29th, 5 P.
Mean reduced to freezing and sea-level, ... 30.000
Annual range, ... 1.76

***Air Temperature.** In degrees Fahr.

Highest, ... 97.0, July 24th, 3 P.
Lowest, ... —9.0, Jan. 5, 5-30 A.
Mean hourly, ... 47.4
Mean of means of max. and min., ... 47.8
Mean sensible (wet bulb), ... 42.4
Annual range, ... 106.0
Highest mean daily, ... 80.1, July 10
Lowest mean daily, ... 0.0, Jan. 5
Mean maximum, ... 53.5
Mean minimum, ... 33.8
Mean daily range, ... 19.7
Greatest daily range, ... 42.0, Mar. 29
Least daily range, ... 2.5, Jan. 25

Humidity.

Mean dew point, ... 38.3
Mean force of vapor, ...379
Mean relative humidity, ... 76.0

Wind.

Prevailing direction, ... West, Northwest

Summary.

South, Southwest, ... 13 per cent.
West, Northwest, ... 12 " "
Northwest, ... 10 " "
North, Northwest, ... 10 " "
Other directions, ... 55 " "
Total movement, ... 59.242 m
Greatest daily movement, ... 468 m., Nov. 27
Least daily movement, ... 28 m., Jan. 17
Mean daily movement, ... 162 m
Mean hourly velocity, ... 6.8 m

Maximum pressure per square foot, 15.0 lbs.=55 m. per hour, Jan. 3, 11 P., N.N.W. and Feb. 23, 11 A., W.N.W.
Maximum velocity for 5 minutes, 42 m. per hour, Dec. 30, 4 P., N.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 36.11
Number of days on which .01 or more rain or melted snow fell, ... 117
Snow total in inches, ... 44.5

Weather.

Mean cloudiness observed, ... 54 per cent.
Total cloudiness recorded by Sun Thermometer, ... 1661 hrs.=37 per cent.
Number of clear days, ... 142
Number of fair days, ... 152
Number of cloudy days, ... 71

Bright Sunshine.

Number of hours recorded, 2793 hrs.=63 per cent

Dates of Frosts.

Last, ... May 6th
First, ... Sept. 23d

Dates of Snow.

Last, ... March 14th
First, ... Oct. 27th
Total days of sleighing, ... 53

Gal s of 50 or More Miles Per Hour.

Jan. 3d, 55 m., N.N.W.; 4th, 51 m., N.N.W.
Feb. 23d, 55 m., W.N.W.

*Temperature in ground shelter.

C. M. DAMON,
Observer.

J. E. OSTRANDER,
Meteorologist.

BULLETIN No. 265. JANUARY, 1910

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.34, 24th, 8 A.
Minimum reduced to freezing,	28.85, 30th, 7 A.
Reduced† maximum reading,	30.66, 24th, 8 A.
Reduced† minimum reading,	29.16, 30th, 7 A
Mean semi-daily reduced,	30.139
Monthly range,	1.50

***Air Temperature.** In Degrees Fahr.

Highest,	50.5, 2d, 7:30 P.
Lowest,	1.5, 18th, 7 A.
Mean hourly,	27.4
Mean of means of max. and min.,	27.5
Mean sensible (wet bulb),	24.5
Monthly range,	49.0
Highest mean daily,	44.3, 2d
Lowest mean daily,	10.5, 16th
Mean maximum,	35.8
Mean minimum,	19.2
Mean daily range,	16.6
Greatest daily range,	31.0, 30th
Least daily range,	4.0, 14th, 27th

Humidity.

Mean dew point,	19.7
Mean force of vapor,	.154
Mean relative humidity,	78.8

Precipitation. In inches.

Total precipitation,	2.36
Number of days on which .01 inch or more rain fell,	14
Total snow in inches	1.75

*Temperature in ground shelter.
†Reduced to freezing and sea-level.

Wind.

Total movement,	6085m
Greatest daily movement,	505m., 30th
Least daily movement,	25m., 14th
Mean daily movement,	196 m
Mean hourly velocity,	8.2 m

Maximum pressure per square foot, 19.0 lbs.= 62m. per hour, 30th, 5 P., W.

Maximum velocity for 5 minutes, 50m. per hour 30th, 5 P., W.

Prevailing Direction, West.

Summary.

Northwest	19 per cent.
South Southwest	10 " "
South	10 " "
West Northwest	23 " "
West	13 " "
Northeast,	10 " "
Other directions	15 " "

Weather.

Mean cloudiness observed, ... 62 per cent.

Total cloudiness recorded by the Sun Thermometer, ... 149 hrs.=51 per cent.

Number of clear days,	9
Number of fair days,	10
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, . . 145 hrs.=49%

Rain, 1st, 2d, 3d, 4th, 8th, 9th, 11th, 12th, 13th, 14th, 21st, 26th, 27th, 28th, 29th.

Snow 4th, 6th, 9th, 14th, 15th, 26th, 27th, 29th, 30th.

Days Sleighing, None.

Gales, 35 or more miles per hour: 41m, 9th, W.N.W.; 40m, 10th, N.N.W.; 40m, 16th, W.N.W.; 57m, 28th, W.N.W.; 62m, 30th, W.; 39m, 31st, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.64	30.27	30.496	34.5	3 P	15.5	0 A	25.0	26 5	26.7	0.0
2	30.27	30.03	30.066	50.5	7:30 P	32.0	0 A	41.3	44.3	47.7	0.0
3	30.04	29 75	29.898	47.0	0 A	33.0	12 P	40.0	39.8	39.0	0.0
4	30.29	29.83	30.202	33.0	0 A	8.0	12 P	20.5	20.7	16.0	8.0
5	30.26	30.02	30.182	24.0	2:30 P	4.5	6 A	14.3	13.0	10 7	6.3
6	30.36	30.21	30.304	24.0	4 P	11.5	7 A	17.7	17.9	16.7	5.0
7	30.21	30.04	30:130	38.0	3 P	20.0	2 A	29.0	27.0	23.7	6.8
8	30.12	29 56	29.920	41.5	4 P	16.5	7:30 A	29.0	30.5	28.7	5.0
9	30 02	29.50	29.712	40.0	0 A	23.0	12 P	31.5	31.2	28.3	2.2
10	30.34	30.02	30.266	39.0	3 P	23.0	0 A	31.0	29.5	24.0	8.8
11	30.25	29.97	30.053	40.0	3 P	27.5	0 A	33.7	35.5	31 3	0.0
12	30.49	30.00	30.298	42.0	3 P	27.5	12 P	34.7	34.9	30.5	3.0
13	30.50	30.22	30.314	33.0	5 P	25.5	4 A	29.3	29.2	27.7	0.0
14	30.22	29.84	30.026	35.0	1 P	31.0	0 A	33.0	32.7	32.3	0.0
15	29.96	29.74	29.843	37.5	12 M	17.5	12 P	27.5	30.6	28.0	0 0
16	30.31	29.96	30.250	18.0	0 A	5.5	8:30 A	11.7	10.5	5.3	8 7
17	30.42	30.26	30.353	19.5	4:30 P	6.0	7 A	12.7	10.9	7.0	8 8
18	30.55	30.40	30.481	28.0	3 P	1.5	7 A	14.7	13 3	8.5	8.8
19	30.40	29.91	30.082	37.0	6 P	10 0	7:30 A	23 5	23.6	21.3	4.3
20	30.21	29.99	30.151	39.0	3 P	23.5	6:30 A	31.3	30.2	25.3	7.7
21	29.99	29.61	29.755	40.0	9 P	31.0	2 A	35.5	35.2	35.7	0.3
22	30.39	29.90	30.258	32.0	0 A	20.5	12 P	26.3	26 5	21.7	6.0
23	30.59	30.39	30.533	36.5	4 P	15.5	7:30 A	26.0	24.1	18.7	8.7
24	30 66	29.42	30.548	41.5	3:30 P	14.0	8 A	27.7	26.8	21.0	8.3
25	30.51	30.40	30.467	44.5	2:30 P	27.0	1 A	35 7	34.5	30.0	6.8
26	30.51	30.15	30.334	37.5	4 P	29.5	7:30 A	33.5	33.2	30.3	2.7
27	30.15	29.84	29.973	35.0	12 M	31.0	4 A	33.0	32.5	32.0	0.0
28	30.24	29.74	29.953	42 0	11:30 A	25.0	12 P	33.5	34.3	30.7	6.3
29	30.25	29.41	29.904	37.0	3 P	22.0	7:30 A	29.5	29.5	27.3	6.0
30	29.77	29.16	29 414	41.5	10:30 A	10.5	12 P	26.0	28.0	24.7	7.5
31	30.11	29.77	30.034	21.5	4 P	7.5	7:30 A	14.5	13.2	9.3	9.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	25.0	.151	94.0	S.	158	0.0	—	—	2 P	12 P	.10	
2	47.5	.334	98.0	S.	156	1 5	17	12 M	0 A	12 P	.21	
3	37.5	.244	95.5	N.W.	145	0.5	10	2 P	0 A	12 P	.52	
4	11.5	.100	77.5	N.W.	260	2.5	22	1 P	0 A	2 A	.12	½
5	8.5	.077	89.0	S.S.W.	181	5.5	33	4 P				
6	13.5	.101	94.0	S.S.W.	130	0.5	10	12 M	5 P	7 P	.01	¼
7	21.5	.136	87.5	W.N.W.	60	0.0	—	—				
8	28.0	.175	95.0	S.W.	99	4 5	30	10 P	8 P	12 P	T	
9	24.0	.168	80.0	W.N.W.	366	8.5	41	7 P	5 A	5 A	.13	T
10	18 0	.144	70.5	N.W.	268	8.0	40	2 A				
11	22.5	.211	59.0	S.	254	1.5	17	7 A	8 P	12 P	.03	
12	26.0	.188	75.0	W.N.W.	116	0.5	10	3 P	0 A	10 A	T	
13	25.5	.160	86.5	N.E.	53	0.0	—	—	10 A	1 P	.01	
14	31.0	.186	95.0	E.S.E.	25	0.0	—	—	0 A	10 P	.08	T
15	22.5	.171	73.5	N.W.	154	5.5	33	5 P	4 P	6 P	T	T
16	-6.5	.063	56.5	W.N.W.	370	8.0	40	6 A				
17	-7.5	.070	45.0	W.N.W.	67	2.0	20	3 P				
18	2.0	.072	73 5	W.	245	0.0	—	—				
19	19.5	.129	91.5	W.	158	5.5	33	7 P				
20	16.0	.156	59.0	W.S.W.	199	2.0	20	2 A				
21	35.0	.215	93.5	W.	260	3.0	24	9 A	6 A	10 P	.08	
22	13.0	.134	63.0	N.N.W.	199	0.5	10	10 P				
23	12.5	.113	73.0	W.N.W.	130	0.5	10	2 A				
24	16.5	.128	80.0	W.S.W.	172	1.0	14	1 P				
25	25.0	.186	73.0	W.	123	0 0	—	—				
26	27.5	.177	87.0	N.E.	41	2.5	22	9 P	3:30 P	12 P	.07	T
27	30.5	.185	95.0	N.E.	39	0.0	—	—	0 A	12 P	.80	T
28	23.0	.206	72 5	N.W.	404	16.0	57	4 P	0 A	5 A	.12	
29	24.0	.158	85.0	S.S.W.	348	4.0	32	7 P	4 P	12 P	.08	1
30	19.0	.166	72.0	W.N.W.	505	19.0	62	5 P	4 P	5 P		T
31	-2.0	.078	53.5	N.W.	400	7.5	39	1 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was more or less abnormal in several respects; the most noticeable departures being in the temperature and precipitation records. The general absence of snow on the ground and a large wind movement were other features of interest.

A comparison of the records of the several weather elements with the normals shows the following characteristics: The mean barometer was considerably above the normal January record while the maximum and minimum were about average records. The fluctuations in pressure were large even for this time of year although the range was practically normal.

The mean temperature was about four degrees above the normal making it an unusually warm January. The maximum temperature was normal while the minimum was about ten degrees higher than usual, owing to the absence of extreme zero weather.

The mean dew point and relative humidity were both slightly higher than the normals.

The total precipitation was about two-thirds the usual amount and practically all of it occurred as rain, and was generally distributed throughout the month.

The total wind movement was about one-fourth more than the average, the records of the last four days being especially large.

The percentage of observed cloudiness was slightly above the average.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 266. FEBRUARY, 1911

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.31, 16th, 8 A.
Minimum reduced to freezing,	29.24, 4th, 2 P.
Reduced† maximum reading,	30.64, 16th, 8 A.
Reduced† minimum reading,	29.55, 4th, 2 P.
Mean semi-daily reduced,	30.116
Monthly range,	1.09

***Air Temperature.** In Degrees Fahr.

Highest,	51.5, 25th, 2:30 P.
Lowest,	-3.0, 16th, 7:30 A.
Mean hourly,	23.3
Mean of means of max. and min.,	22.8
Mean sensible (wet bulb),	20.0
Monthly range,	54.5
Highest mean daily,	39.4, 26th.
Lowest mean daily,	5.8, 6th
Mean maximum,	31.7
Mean minimum,	13.9
Mean daily range,	17.8
Greatest daily range,	44.0, 16th
Least daily range,	6.3, 20th

Humidity.

Mean dew point,	15.3
Mean force of vapor,	.126
Mean relative humidity,	77.6

Precipitation. In inches.

Total precipitation,	2.18
Number of days on which .01 inch or more rain fell,	8
Total snow in inches	10.8

*Temperature in ground shelter.
†Reduced to freezing and sea-level.

Wind.

Total movement,	5515m
Greatest daily movement,	464m., 23d
Least daily movement,	14m., 9th
Mean daily movement,	197 m
Mean hourly velocity,	8.2 m
Maximum pressure per square foot,	9.5 lbs.= 44m. per hour, 5th, 10 A., W.N.W.
Maximum velocity for 5 minutes,	30m. per hour 27th, 10:30 P., W.N.W.
Prevailing Direction,	West Northwest.

Summary.

West	18 per cent.
West Northwest	18 " "
North Northwest	14 " "
North	14 " "
South	11 " "
Other directions	25 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	164 hrs.=55 per cent.
Number of clear days,	10
Number of fair days,	5
Number of cloudy days,	13

Bright Sunshine.

Number of hours recorded,	132 hrs.=45%

Rain, 2d, 4th, 17th.

Snow 2d, 3d, 4th, 6th, 7th, 8th, 9th, 11th, 13th, 14th, 18th, 20th, 22d, 24th.

Days Sleighing, 22.

Gales, 35 or more miles per hour: 36m, 4th, W.N.W.; 44m, 5th, W.N.W.; 36m, 23d, W.S.W.; 36m, 27th, N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximum.	Minimum.	Mean, Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.36	30.11	30.318	29.0	3 P	5.5	8 A	17.3	17.5	10 7	9.0
2	30.34	29 75	29.969	21.0	3 P	13.0	12 P	17.0	17.4	16.3	0.0
3	30.39	30.09	30.340	22.5	12 P	5.0	7:30 A	13.7	15.2	14.0	8.0
4	30.18	29.55	29.768	40.0	7 P	20 0	3 A	30.0	30.3	31.3	0 0
5	30 44	29.84	30.198	37.0	0 A	10.0	12 P	23.5	25.1	21.0	9.5
6	30.51	30.38	30.474	10.0	0 A	1.5	7:30 A	5.7	5.8	4.5	0.0
7	30.38	30.21	30.292	23.0	4 P	9.0	0 A	16.0	16.7	16.0	0.0
8	30.35	30.19	30.277	23.5	1 P	11.5	5 A	17.5	20.0	19.0	0.0
9	30.19	29.90	30.055	32.5	3 P	21.5	6 A	27.0	26.1	23.3	0.0
10	30.09	29 81	29.926	32.5	4 P	20.5	7:30 A	26.5	26.7	24.3	2.5
11	30.30	30.09	30.274	32.0	2 P	19.0	12 P	25.5	26.2	21.3	8.1
12	30.25	30.04	30.089	36.5	4 P	11.5	7:30 A	24.0	26.4	22.7	3.7
13	30.14	30.08	30.132	36.0	0 A	27.5	12 P	31.7	31.4	28 0	0.0
14	30.31	30.13	30.212	27.5	0 A	18.0	12 P	22.7	23.4	20.0	0.0
15	29.59	30.31	30.512	27.0	3:30 P	6.0	12 P	16.5	14.9	8.7	7.4
16	30.64	30.51	30.608	41.0	4 P	−3.0	7:30 A	19 0	16.2	10.0	9.6
17	30.55	29.85	30.158	36.0	12 P	11.0	3 A	23.5	26.1	25.5	0.0
18	29.90	29.83	29.872	40.5	1 P	29.5	12 P	35.0	36 6	31.5	6.5
19	30.15	29.90	30.088	30.0	0:30 A	15.0	12 P	22.5	23.9	18.7	9.5
20	30.15	29.76	29.920	19.0	4 P	12.5	8 A	15.7	14.8	13.7	0.0
21	30.10	29.88	30.068	23.0	3 P	2.5	7:30 A	12.7	13 0	8.5	9.5
22	29.99	29.78	29.860	32.0	3 P	6.5	0 A	19.3	21.8	18.5	6.7
23	30.07	29.75	29.924	28.5	4 P	12.5	7 A	20.5	20.0	16.0	9.8
24	29.84	29.58	29.686	37.0	1 P	18.5	1:30 A	27.7	27.5	25.3	8.7
25	30.07	29.80	29.924	51.5	2:30 P	21.5	0 A	36.5	35.1	31.3	7.7
26	30.08	29.88	29 980	50.5	2 P	27.5	7:30 A	39.0	39.4	36.3	5.5
27	30.22	29.93	30.122	45.0	2 A	22.0	12 P	33.5	36.0	28.5	1.7
28	30.25	30.13	30.202	24 0	4 P	15.0	7 A	19.5	19 3	15.5	9.1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	0.0	.085	57.0	N.N.W.	80	0.5	10	12 M				
2	14.5	.095	90.5	N.N.W.	143	0.0	—	—	0 A	8 P	.39	1.5
3	10.5	.091	83.0	N.N.E.	140	0.0	—	—	12 M	12 P	T	T
4	28.5	.188	87.0	W.N.W.	113	6.5	36	7 P	0 A	7 P	.94	2.5
5	17.0	.125	81.0	W.N.W.	381	9.5	44	10 A				
6	−1.0	.058	76.0	N.	239	4 0	28	8 A	2 P	12 P	.08	0.5
7	13.0	.098	81.0	N.	287	2.5	22	6 A	0 A	12 M	.41	3.0
8	17.5	.108	92.0	W.	80	0.5	10	9 A	2 P	11 P	.12	1.0
9	20.5	.133	85.0	S.	14	0.0	—	—	10 A			T
10	21.5	.138	85.0	W.	90	3.0	24	5 P				
11	16.0	.125	74.0	W.S.W.	267	3.0	24	11 A	8 A	9 A	T	T
12	19.5	.142	82.0	W.	58	0.0	—	—				
13	24.5	.160	84.0	W.S.W.	68	0.0	—	—	12 M	12 P	T	T
14	16.0	.116	79.0	N.E.	153	2.0	20	10 P	0 A	11 P	.06	0.3
15	−1.5	.073	59.5	N.	182	1.0	14	3 P				
16	4.0	.082	74.5	N.N.W.	58	0 0	—	—				
17	20.0	.154	74 5	S.S.W.	234	3.0	24	12 M	9 A	12 P	.07	
18	25.5	.200	71.5	N.W.	258	3 0	24	2 P	5 P	5:30 P		T
19	11.5	.116	67.5	N.N.W.	259	2.0	20	9 A				
20	10.5	.087	86.5	N.	191	2.0	20	6 P	7:30 A	11 P	.11	2.0
21	4.0	.071	76.0	N W.	234	1.0	14	3 P				
22	15.5	.113	83.0	W.	246	3.0	24	4 P	7 P	8 P	T	T
23	11.0	.101	72.5	W.	464	6.5	36	5 P				
24	22.5	.146	82.5	W.N.W.	301	3.5	26	3 P	11 A			T
25	27.5	.192	80.5	S.	106	0.0	—	—				
26	32.5	.233	82.5	S.	129	0.5	10	1 P				
27	19.0	.194	56.0	W.N.W.	299	6.5	36	7 P				
28	8.5	.098	69.5	W.N.W.	441	5.0	31	5 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during February was the most seasonable of the winter, and departures from normal conditions were comparatively unimportant. The barometer and wind movement records showed some departure from mean values, but the effect on the weather as a whole was not noticeable.

Comparing the records with the several meteorological elements with the 20 year summary of values for this station shows the following features for the month. The mean barometer was considerably higher than the normal, and the range was the smallest, with one exception, for this month. This was due to the absence of marked periods of low pressure during the month. The total wind movement was considerably more than normal and mostly from the westerly points of the compass.

The mean temperature was normal, although the minimum was about 6 degrees above the normal value. Zero temperature was noted on but a single date, and then only for a few hours. The maximum temperature was but slightly above the average. A range of 44 degrees in a single day was a rather unusual occurrence.

The mean relative humidity was practically normal, while the mean dew point was nearly two degrees below the average.

The total precipitation was about two-thirds the normal, and nearly all of it occurred as snow. Sleighing began on the 4th and continued until the 26th.

The amount of cloudiness was in excess of the usual values.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 267. MARCH, 1911

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 40, 7th, 10 A.
Minimum reduced to freezing,	28.64, 30th, 6 A.
Reduced† maximum reading,	30.72, 7th, 10 A.
Reduced† minimum reading,	28.95, 30th, 6 A.
Mean semi-daily reduced,	29.985
Monthly range,	1.77

***Air Temperature.** In Degrees Fahr.

Highest,	59.0, 26th, 4:00 P.
Lowest,	2.5, 7th, 7:30 A.
Mean hourly,	31.5
Mean of means of max. and min.,	31.7
Mean sensible (wet bulb),	27.6
Monthly range,	56.5
Highest mean daily,	46.5, 27th.
Lowest mean daily,	15.0, 16th
Mean maximum,	42.0
Mean minimum,	21.5
Mean daily range,	20.5
Greatest daily range,	44.0, 26th
Least daily range,	7.0, 31st

Humidity.

Mean dew point,	22.2
Mean force of vapor,	.175
Mean relative humidity,	73.2

Precipitation. In inches.

Total precipitation,	3.80
Number of days on which .01 inch or more rain fell,	11
Total snow in inches	10.5

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

Wind.

Total movement,	7485m
Greatest daily movement,	605m., 16th
Least daily movement,	69m., 9th
Mean daily movement,	241 m
Mean hourly velocity,	10 m

Maximum pressure per square foot, 21.0 lbs.= 65m. per hour, 16th, 9 A., W.N.W.

Maximum velocity for 5 minutes, 44m. per hour 16th, 9:30 P., W.N.W.

Prevailing Direction, West.

Summary.

West	13 per cent.
West Southwest	23 " "
Northwest	16 " "
South Southwest	10 " "
South	10 " "
Other directions	28 " "

Weather.

Mean cloudiness observed,	49 per cent.
Total cloudiness recorded by the Sun Thermometer,	135 hrs.=36 per cent.
Number of clear days,	15
Number of fair days,	9
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, . . 236 hrs.=64%

Rain, 3d, 12th, 15th, 18th, 20th, 22d, 27th, 29th, 30th.

Snow 2d, 3d, 6th, 10th, 15th, 16th, 19th, 20th, 21st, 31st.

Sleet, 15th, 18th.

Hail, 27th.

Days Sleighing, none.

Thunder and Lightning, 27th, 29th.

Gales, 35 or more miles per hour: 42m, 15th, W.N.W.; 65m, 16th, W.N.W; 35m, 20th, W.N.W.; 36m, 21st, W.N.W.; 41m. 22d, W.N.W.; 41m. 23d, W.N.W.; 42m, 28th, W.; 35m, 31st W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	29.62	29.813	36.5	3 P	15.0	7 A	25.7	25.8	20.5	9.7
2	29.80	29.54	29.638	39.0	4 P	23.0	12 P	31.0	31.0	27.7	9.2
3	30.00	29.80	29.962	36.0	3 P	19.5	7 A	27.7	27.0	25.3	6.5
4	30.29	30.00	30.150	35.0	4 P	22.0	12 P	28.5	26.7	22.7	8.7
5	30.54	30.29	30.491	29.0	4 P	12.0	7 A	20.5	21.0	16.0	10.8
6	30.58	30.19	30.337	31.0	3 P	17.0	12 P	24.0	22.8	19.7	7.5
7	30.72	30.49	30.611	34.5	4 P	2.5	7:30 A	18.5	18.7	15.5	10.1
8	30.49	30.26	30.394	46.0	5 P	4.0	7 A	25.0	23.5	16.7	10.8
9	30.33	29.90	30.117	54.0	4 P	11.0	7:30 A	32.5	33.1	28.0	10.1
10	29.92	29.47	29.658	43.0	5 P	32.5	8:30 A	37.7	36.9	34.0	2.3
11	30.27	29.92	30.220	48.0	5 P	26.0	7 A	37.0	34.7	29.3	11.0
12	30.26	29.99	30.108	38.5	5 P	27.0	1 A	32.7	34.9	32.0	0.0
13	30.44	30.07	30.398	46.0	5 P	28.5	12 P	37.3	37.3	30.3	10.0
14	30.43	30.10	30.306	51.0	3 P	22.0	7 A	36.5	35.5	28.7	10.5
15	30.10	29.38	29.524	51.0	3:30 P	23.5	12 P	37.3	37 5	33.0	7.8
16	30.08	29.51	29.750	23.5	0 A	10.0	7 A	16.7	15.0	12.0	8.2
17	30.34	30.08	30.285	34.5	4 P	11.0	6:30 A	22.7	23.9	19.5	10.8
18	30.23	29.96	30.058	41.5	4 P	29.5	0 A	35.5	35.2	33.5	0.3
19	30.29	29.70	30.038	41.0	2 P	21.5	6:30 A	31.3	32.0	28.0	7.2
20	29.70	29.47	29.578	41.5	2 P	23 0	6:30 A	32.3	34.2	31.5	4.3
21	30.05	29.59	29 914	41.0	4 P	31.0	6:30 A	36.0	35.1	31.5	11.5
22	30.05	29 41	29.616	57.0	2 P	29.5	4:30 A	43.3	42.5	40.7	6.5
23	30.11	29.52	29.908	40.0	0 A	18.0	12 P	29.0	29.2	24.3	10.0
24	30.46	30.11	30.353	30.0	4:30 P	14.0	6:30 A	22.0	20.7	17.7	11.3
25	30.58	30.38	30.501	46.0	4:30 P	13.5	6:30 A	29.7	28.4	28.3	11.4
26	30.42	30.18	30.320	59.0	4 P	15.0	6 A	37.0	40.8	34.3	10.0
27	30.18	29.41	29.722	52.0	1:30 P	41.0	2 A	46.5	46.5	47.3	0.0
28	29.65	29.36	29.506	42.0	0 A	31.5	10 P	36.7	36.1	31.0	0.7
29	29.73	29.17	29.565	50.5	3:30 P	29.5	6 A	40.0	38.7	35.0	8.0
30	29 30	28.95	29.178	46.0	1:30 P	34.0	12 P	40.0	39 2	34.5	2.8
31	29.72	29.29	29.522	37.0	3 P	30.0	12 P	33.5	33.1	28.5	7.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	14.5	.127	70.5	W.S.W.	227	5.0	32	7 P				
2	23.0	.164	78.5	W.	277	0.0	—	—	5 P			T
3	23.5	.143	91.5	W.S.W.	160	0.0	—	—	3 P	10 P	T	T
4	17.5	.136	72.5	N.W.	130	3.0	24	11 P				
5	5.5	.107	54.0	W.	155	0.5	10	1 A				
6	15.5	.116	80.0	N.W.	112	5.0	32	5 P	5 A	2 P	.19	4.0
7	12.5	.097	83.5	N.	136	0.0	—	—				
8	8.0	.111	62.0	N.N.W.	94	0.5	10	12 M				
9	21.5	.180	73.0	W.S.W.	69	0.0	—	—				
10	31.0	.213	83.0	E.N.E.	252	3.5	26	7 P	6:30 A	2 P	.15	1.0
11	23.5	.184	71.0	N.	258	4 0	28	8 A				
12	26.0	.205	70.0	S.	194	2.5	22	9 A	11 A	8 P	.07	
13	20.5	.200	58.0	N.N.W.	259	4.5	30	4 A				
14	21.5	.187	61.5	S.S.W.	108	0 5	10	3 P				
15	29.5	.199	86.0	N.W.	219	9.0	42	8 P	1 A	12 P	.91	0.5
16	8.0	.083	72.0	W.N.W.	605	21.0	65	9 A	9 A	11 P	T	T
17	7.0	.128	50.5	S.W.	308	4.5	30	1 A				
18	30.5	.206	84.0	S.W.	304	2.5	22	0 A	6 A	12 M	.06	
19	22.5	.170	73.0	S.S.W.	138	1.5	17	12 M	4 P	12 P	.67	4.5
20	27.5	.197	78.0	W.S.W.	163	6.0	35	8 P	0 A	12 P	.01	T
21	27.0	.194	79.0	N.W.	375	6.5	36	1 P	3 A	5 A	.01	0.5
22	37.5	.287	80.5	S.S.W.	120	8.5	41	11P	4 P	10 P	.02	
23	17.5	.147	67.5	W.N.W.	519	8.5	41	2 A				
24	11.5	.110	71.0	N.W.	354	3.0	24	12 M				
25	26.0	.146	82.0	W.S.W.	181	1.0	14	5 P				
26	27.5	.237	64.5	S.	171	0.5	10	5 P				
27	46.5	.332	94.5	S.	384	3.5	26	7 A	4 A	11:30 P	.90	
28	23.5	.202	63.5	W.	370	9.0	42	6 P				
29	28.5	.236	69.5	W.S.W.	234	2.5	22	3 A	6:30 P	12 P	.81	
30	30.0	.220	76.0	W.S.W.	296	2.5	22	4 P	0 A	8 P	T	
31	23.0	.176	69 5	W.	313	6.0	35	1 P	10 A	3 P	T	T

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was seasonal to an unusual degree, and was marked by rapid changes in temperature and pressure which had their effect on the other weather elements. Many gales were noted, and snow, hail, sleet, rain and thunder and lightning all found a place on the records. Notwithstanding the great variety of the weather the month closed with the season somewhat backward.

The mean barometer of the month was slightly lower than the normal and the range of pressure was greater than any March record in our twenty years' summary. The minimum barometer equalled the previous low records of March, 1899 and 1902. The barometer chart showed large waves of pressure and rapid changes throughout the month.

As would be expected from the barometric record the total wind movement was exceptionally large, in fact, the largest March record; excepting that of 1896.

The mean temperature was two degrees lower than the normal and the maximum and minimum records both slightly lower than the average values. While the range was practically normal, the greatest daily range of 44 degrees on the 26th was very unusual here: especially as the total change occurred in a period of ten hours.

The mean dew point was about four degrees lower than the average while the relative humidity was practically normal.

The total precipitation was slightly less than the normal and was fairly well distributed throughout the month. The snowfall was practically the same as that of the previous month but it melted soon after it fell so that there was no sleighing.

The total wind movement has already been referred to: the maximum daily movement of 605 miles was very exceptional for this locality. Nearly all the gales, which were numerous, were from the west northwest.

The amount of cloudiness given by the sunshine recorder was less than the normal for this station.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 41, 13th, 9 A.
Minimum reduced to freezing,	29.27, 7th, 3 A.
Reduced† maximum reading,	30.71, 13th, 9 A.
Reduced† minimum reading,	29.57, 7th, 3 A
Mean semi-daily reduced,	30.144
Monthly range,	1.14

***Air Temperature.** In Degrees Fahr.

Highest,	86.0, 29th, 3:00 P.
Lowest,	18.0, 4th, 6 A.
Mean hourly,	43.7
Mean of means of max. and min.,	43.5
Mean sensible (wet bulb),	36.9
Monthly range,	68.0
Highest mean daily,	64.8, 29th.
Lowest mean daily,	25.6, 2d
Mean maximum,	56.4
Mean minimum,	30.6
Mean daily range,	25.8
Greatest daily range,	44.0, 29th
Least daily range,	8.0, 5th

Humidity.

Mean dew point,	30.1
Mean force of vapor,	.289
Mean relative humidity,	65.2

Precipitation. In inches.

Total precipitation,	1.87
Number of days on which .01 inch or more rain fell,	5
Total snow in inches	6.5

Wind.

Total movement,	5738m
Greatest daily movement,	406m., 1st
Least daily movement,	62m., 19th
Mean daily movement,	191.3 m
Mean hourly velocity,	8.0 m

Maximum pressure per square foot, 9.0 lbs.= 42m. per hour, 16th, 1 P., W.N.W.

Maximum velocity for 5 minutes, 45m. per hour 16th, 1 P., W.N.W.

Prevailing Direction, West.

Summary.

South	23 per cent.
West	13 " "
North Northwest	10 " "
South Southwest	10 " "
Other directions	44 " "

Weather.

Mean cloudiness observed,	42 per cent.
Total cloudiness recorded by the Sun Thermometer,	106 hrs.=26 per cent.
Number of clear days,	19
Number of fair days,	7
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 296 hrs.=74%

Rain, 5th, 14th, 15th, 19th, 20th, 30th.

Snow 1st, 2d, 4th, 5th, 9th, 16th, 19th.

Hail, 19th, 20th.

Frosts, 4th, 12th, 13th, 18th, 24th.

Gales, 35 or more miles per hour: 41m, 2d, W.N.W.; 42m, 16th, W.N.W.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.98	29 72	29.887	36.5	3 P	23 5	12 P	30.0	29 3	25.3	11.3
2	30.21	29.98	30.107	32.5	2 P	19 0	6 A	25 7	25.6	22.3	10.3
3	30.50	30.21	30.403	42.5	3:30 P	20.0	6 A	31.3	30.2	26.5	11.8
4	30.59	30.18	30.440	42.0	1 P	18.0	6 A	30.0	30.7	26.7	6.9
5	30 18	29.66	29.806	38.0	10 P	30.0	0 A	34 0	34.1	32.5	0 3
6	29.85	29 64	29.759	68.0	4:30 P	35.0	0 A	51.5	50.1	47.0	11.4
7	30.17	29.57	29.918	52.5	0 A	36 0	12 P	44.3	46.5	38.3	9.5
8	30.31	30.17	30.245	53.0	3 P	28.0	6:30 A	40.5	41.9	35.5	10.3
9	30.32	30.16	30.216	43.5	4 P	31.5	5:30 A	37.5	36.6	32.3	8.5
10	30.54	30.32	30.453	52 0	5 P	25.0	5:30 A	38.5	39.3	18.0	12.2
11	30.63	30.54	30.609	54.0	4 P	23.5	6 A	38.7	39 0	32.5	12.4
12	30.70	30.59	30.691	58.0	2:30 P	25 0	6 A	41.5	40.2	32 5	12.2
13	30.71	30.50	30.607	63.5	2:30 P	24.0	6 A	43.7	44.0	36.7	12.0
14	30.51	30.01	30 163	54.0	1 P	37.0	4:30 A	45.5	46 6	45 3	0.2
15	30.01	29.80	29.928	60.0	4:30 P	38.0	12 P	49 0	48.2	41.7	7.8
16	29.90	29.75	29.836	48.0	1 P	33.0	3 A	40.5	39.5	33.5	11.0
17	29.98	29.87	29.938	47.5	12 M	30.0	6 A	38.7	38 2	33.7	12.3
18	30.06	29.93	30.016	55.5	4:30 P	25.5	6 A	40 5	40.1	34 5	12.4
19	30.08	29.79	29.964	53.0	4:30 P	25.0	6 A	39.0	40.7	35.3	4.7
20	29.85	29.68	29.758	50.0	3:30 P	35 0	5 A	42.5	41.4	36.0	4.3
21	30.01	29.83	29.910	57.5	3:30 P	29.5	6 A	43.5	43.8	37.0	10.8
22	30.15	30.01	30.112	48.0	1:30 P	35.5	7 A	41.7	40.2	34.5	8.7
23	30.23	30.13	30.206	46.0	4:30 P	34.0	12 P	40.0	40.3	35.5	9.3
24	30.22	30.06	30.156	67.5	4 P	26 0	6 A	46.7	48.0	40 5	13.0
25	30.30	30.11	30.200	71.0	3:30 P	30.5	5 A	50.7	52.9	44.3	12.6
26	30.47	30.30	30.404	73.5	3:30 P	31.0	5:30 A	52.3	53.0	42.5	12.7
27	30.52	30.36	30.456	80.0	3 P	36.5	6 A	58.3	59.1	49.0	11.2
28	30.41	30.13	30.248	83.0	2:30 P	44.0	5:30 A	63.5	64.0	51.0	12.0
29	30.16	29.89	30.009	86.0	3 P	42.0	6 A	64.0	64.8	50.5	12.0
30	29 93	29.81	29.864	74.0	1:30 P	48.0	6 A	61.0	61 4	57.3	11.6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	19.5	.151	72.0	W.	406	5.5	33	4 P	7 A	2 P		T
2	16.5	.160	69.0	W.N.W.	376	8.5	41	3 P	3 P			T
3	21.0	.158	75.0	N.W.	187	1.5	17	10 A				
4	22.5	.157	80.5	S.	117	0.5	10	6 P	4 P	12 P	.40	2.5
5	30.5	.190	92.5	N.E.	83	0.0	—	—	0A	12 P	.60	T
6	44.0	.373	75.5	S.W.	163	4.5	30	7 P				
7	30.5	.284	61.5	W.	363	4.5	30	1 P				
8	27.5	.247	63.0	N.N.W.	144	1.5	17	11 P				
9	28.0	.198	81.5	N.	196	2.5	22	3 P	0 A	8 A	.44	4.0
10	23.5	.229	57.0	W.N.W.	156	1.5	17	12 M				
11	20.0	.234	48.0	N.	151	2.5	22	11 A				
12	21.0	.232	68.5	S.S.W.	124	0 5	10	6 P				
13	29.5	.263	63.5	S.S.W.	168	1.5	17	6 P				
14	44.0	.320	91.0	S.	225	2.0	20	3 P	9 A	8 P	.15	
15	37.5	.300	76 5	N W.	139	5.5	33	8 P	8 P		T	
16	25.0	.232	58.5	W.N.W.	278	9.0	42	1 P	2 P	3 P		T
17	24 0	.230	62.0	W.N.W.	291	5.0	32	4 P				
18	25.0	.247	55.5	N.N.W.	211	4 0	28	4 P				
19	28.5	.250	68.0	S.	62	0.0	—	—	8:30 A	2 P	T	T
20	30.0	.242	72.0	N.E.	290	5.0	32	2 P	1 A	1 P	.28	
21	27.5	.275	56.5	E.	124	0.5	10	11 P				
22	28.5	.232	66.5	E.N.E.	184	1.5	17	5 P				
23	27.5	.252	59 5	N.N.E.	230	2.0	20	10 A				
24	27.0	.363	41.5	N.N.W.	189	4.0	28	2 P				
25	30.5	.425	40.5	N.N.E.	155	2.0	20	4 P				
26	34.5	.348	58.0	S.	120	1.5	17	7 P				
27	42.0	.466	59.0	S.S.W.	146	1.5	17	7 P				
28	41.0	.577	47.5	S.	124	0.0	—	—				
29	40.0	.552	48.5	S.	80	0 0	—	—				
30	55 5	.508	86.0	S.	256	4.5	30	2 P	8 P	12 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during April was generally cold and unseasonable, and the advance of Spring was slow until near the end of the month, when a few unusually warm days occurred. High barometer, much sunshine and small precipitation were also important features which had their effect on the general character of the weather.

An analysis of the several weather elements shows the following as the more important features: The mean barometer was the highest for April since 1896, when about the same record was made. The maximum and minimum pressures were both unusually high records, giving a range about equal to the normal value for that element. The maximum record was the highest ever reached in April since the station was established.

The mean temperature was about two degrees lower than the normal, and marked the month as a "cold April." The maximum temperature was about seven degrees higher than the normal April maximum, and was only 2½ degrees lower than our highest record for this month at this station. For three consecutive days near the end of the month the temperature rose to 80 degrees or above—a very unusual occurrence so early in the season.

The minimum temperature was about three degrees below the normal, giving the largest range for April on our records. The mean dew point was extremely low and the relative humidity slightly below the normal.

The total precipitation was about an inch less than usual, and nearly one-half of it occurred as snow. Two snow storms of considerable amount occurred during the first decade—a very unusual feature here. The last three weeks of the month had but little precipitation.

The total wind movement was about ten per cent more than the normal. The pressure chart showed but two gales, and they were of little severity.

The number of clear days was large and the amount of sunshine much above the normal.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 269. MAY, 1911

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 11, 14th, 8 A.
Minimum reduced to freezing,	29.13, 2d, 1:30 A.
Reduced† maximum reading,	30.40, 14th, 8 A.
Reduced† minimum reading,	29.43, 2d, 1:30 A.
Mean semi-daily reduced,	30.034
Monthly range,	0.97

***Air Temperature.** In Degrees Fahr.

Highest,	94.5, 22d, 2:30 P.
Lowest,	27.0, 4th, 4:30A.
Mean hourly,	61.9
Mean of means of max. and min.,	62.5
Mean sensible (wet bulb),	56.0
Monthly range,	67.5
Highest mean daily,	76.2, 22d
Lowest mean daily,	37.6, 3d.
Mean maximum,	75.6
Mean minimum,	49.4
Mean daily range,	26.2
Greatest daily range,	42.5, 7th
Least daily range,	5.5, 24th

Humidity.

Mean dew point,	51.7
Mean force of vapor,	.563
Mean relative humidity,	72.2

Precipitation. In inches.

Total precipitation,	1.37
Number of days on which .01 inch or more rain fell,	8

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

Wind.

Total movement,	4939m
Greatest daily movement,	460m., 3d
Least daily movement,	62m., 30th
Mean daily movement,	159.3 m
Mean hourly velocity,	6.6 m

Maximum pressure per square foot, 7.5 lbs.= 39m. per hour, 3d, 11 A., W.N.W.

Maximum velocity for 5 minutes, 36m. per hour 3d, 5P., W.N.W.

Prevailing Direction, South.

Summary.

South	29 per cent.
South Southeast	13 " "
West Northwest	10 " "
West	10 " "
East Northeast	19 " "
Other directions	28 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	133 hrs.=39 per cent.
Number of clear days,	14
Number of fair days,	12
Number of cloudy days,	5

Bright Sunshine.

Number of hours recorded, . . 320 hrs.=61%

Rain, 1st, 2d, 12th, 18th, 19th, 20th, 24th, 25th, 31st.

Frosts, 4th, 5th.

Thunder and Lightning, 1st, 2d, 12th, 18th, 19th, 25th.

Gales, 35 or more miles per hour: 35m, 2d, W.N.W.; 39m, 3d, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.81	29 47	29.620	68.5	3:30 P	53.0	3 A	60.7	59.6	58.7	3.8
2	29.87	29.43	29.702	57.5	0 A	37.0	12 P	47.3	48.5	43.0	13.1
3	30.11	29.86	30.026	45.0	2:30 P	32.0	5:30 A	38.5	37.6	31.3	10.8
4	30.23	30.11	30.177	54.0	3 P	27.0	4:30 A	40.5	41.3	34.7	13.0
5	30 29	30.18	30.265	66.5	4:30 P	28.0	5 A	47.3	49.3	41.5	13.3
6	30.36	30.18	30.268	73.5	4 P	32.5	5:30 A	53.0	54.9	50.0	13.1
7	30.21	30.09	30.154	80.5	4 P	38.0	6 A	59.3	61.7	51.3	13.0
8	30.18	29 88	30.040	82.0	3 P	44.0	5:30 A	63.0	64.3	56.3	12.7
9	29.88	29.58	29.658	66.5	12 M	48.5	6 A	57.5	58.0	52.7	9.3
10	29.89	29.61	29.804	80.0	3:30 P	40.0	5:30 A	60.0	63.0	62.0	12.5
11	29.94	29.81	29.904	89.0	2 P	58.5	5:30 A	73.7	71.5	59.7	12.1
12	29.97	29.91	29.989	87.0	1 P	59 5	5:30 A	73.3	69.6	61.3	11.3
13	30.27	30.02	30.144	72.0	5 P	50.0	12 P	61.0	61.9	53.7	12.7
14	30.40	30.27	30.376	74.5	3 P	40.0	5 A	57.3	57.8	49.7	13.1
15	30.37	29.99	30.155	74.0	3 P	45.0	5 A	59 5	58.9	47.7	11.3
16	30.02	29.94	29.979	78.5	2 P	53.5	5:30 A	66.0	64.0	57.5	8.1
17	30.09	29.93	30 021	82.0	3:30 P	50 0	5:30 A	66.0	65.7	55 7	13.0
18	29.94	29.76	29.824	85.0	5 P	54.0	5 A	69.5	67.6	63.5	9.2
19	30.03	29.84	29 950	81.0	12 M	61.0	3:30 A	71.0	68.8	66.5	6.0
20	30.10	30.03	30.070	80.0	4 P	59.0	1:30 A	69.5	68.1	65.0	9.0
21	30.10	30.04	30.082	87.0	3 P	67.5	4:30 A	77.3	73.9	68.7	10.8
22	30.11	29.97	30.054	94.5	2:30 P	66.5	5:30 A	80.5	76.2	70.3	9.3
23	30.26	30.04	30.220	71.0	0 A	53.0	12 P	62.0	61.0	57.7	5.8
24	30.24	30.01	30.124	56.5	6 P	51.0	6 A	53.7	53.9	52.3	0.6
25	30.01	29.89	29.939	74.0	2 P	54.0	12 P	64.0	60.2	57.5	8.3
26	30.13	29.98	30.041	73.0	4 P	49.5	3 A	61.3	61.0	58.0	8.4
27	30.19	30.10	30.170	83.5	4 P	51.5	5 A	67.5	67.0	61.7	13.7
28	30.19	30.06	30.148	86.0	3 P	32.5	5 A	69.3	69.6	62.0	13.5
29	30.12	29.97	30.054	86.0	3:30 P	59.0	5:30 A	72.5	71.7	64.7	12.6
30	30.16	30.07	30.126	82.5	5:30 P	62.0	5 A	72.3	68.8	61.3	11.7
31	30.16	29.71	29.976	73.0	12 M	53.5	5:30 A	63.3	62.9	59.7	5.1

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	57.5	.525	92.0	S.	249	2.0	20	7 P	0 A	12 P	.08	
2	37.5	.349	66.5	W.N.W.	355	6.0	35	1 P	0 A	1 A	.09	
3	22.0	.212	55.0	W.N.W.	460	7.5	39	11 A				
4	19.5	.276	39.0	W.N.W.	257	5.0	32	4 P				
5	29.5	.367	44.5	W.	98	1.5	17	12 M				
6	44.5	.426	73.0	S.	79	0.5	10	4 P				
7	50.0	.579	66.5	N.	168	2.0	20	1 P				
8	50.0	.592	62.5	S.W.	146	1.5	17	4 P				
9	48.5	.478	72.0	S.S.E.	97	0 5	10	3 P				
10	61.0	.595	90.0	N.	167	2.5	22	12 M				
11	54.0	.693	59.5	S.	257	4.5	30	5 P				
12	58.5	.634	78.0	S.	243	1.5	17	2 P	7 P	11 P	.12	
13	46.5	.555	57.5	N W.	180	1.5	17	2 P				
14	40.5	.490	49.0	W.	108	1.0	14	9 P				
15	38.5	.460	50.5	S.	256	2.0	20	2 P				
16	54.5	.544	79 5	E.	126	1.0	14	1 A				
17	48.0	.617	55.5	S.W.	138	2.0	20	5 P				
18	60.0	.695	77.0	S.S.E.	113	0.0	—	—	10 A	11 A	T	
19	65.0	.729	85.0	E.N.E.	92	0.5	10	4 A	1 P	12 P	.10	
20	64.5	.669	90.5	S.	108	1.0	14	6 P	0 A	7 A	.01	
21	68.0	.774	86.0	S.	172	0.5	10	5 P				
22	69.5	.825	87.0	W.	71	0.0	—	—				
23	56.0	.547	84.5	N.N.E.	141	1.0	14	10 A				
24	51.5	.407	94.0	N.E.	64	0.0	—	—	8 A	12 P	.04	
25	56.5	.497	91.5	E.N.E.	81	1.5	17	3 P	0 A	9 P	.58	
26	56.5	.545	83.0	E.N.E.	91	0.0	—	—		.		
27	58.5	.668	73.5	S.E.	91	0.0	—	—				
28	58.0	.713	68.0	S.	156	0.5	10	4 P				
29	61.5	.758	71.5	S.	198	1.5	17	4 P				
30	58.0	.654	74.0	S.S.E.	62	0.0	—	—				
31	57.5	.573	83.5	S.S.E.	115	0.0	—	—	2 P	12 P	.35	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during May was unusual in several respects; the most important features which showed marked departures from normal conditions were the temperature and precipitation records. The mean temperature for the month was higher than any previous May record at this station, and the precipitation was unusually small. The accumulated deficiency in precipitation from the first of the year to the end of May was 5.70 inches.

Comparing the monthly records with normal values, the following features are noted: The mean barometer was unusually high for the time of year, and the range of pressure was considerably more than the usual amount. Fluctuations in pressure, however, were not generally rapid.

The mean temperature was about five degrees above the normal—an exceptionally large departure for this weather element—and was less than three degrees under the June normal. The maximum temperature, on the 22d, equalled the previous high May record, made in 1896. The minimum record was about three degrees lower than usual, giving an exceptionally large range for the month. On four different days the maximum temperature was higher than the normal maximum value for May.

The mean dew point and relative humidity were both considerably higher than the normal values.

The total precipitation was slightly more than one-third of the normal, and about one-fourth of it fell on the last day of the month. The May records of 1899, 1903 and 1905 were smaller than the amount recorded this month.

The total wind movement was about ten per cent more than the normal, and much more than usual was from the South. Only two light gales were recorded. Much more than the usual amount of sunshine was recorded, and nearly one-half the days were clear. The last frost occurred early in the month.

J. E. OSTRANDER, Meteorologist.

C. M. DAMON, Observer.

BULLETIN No. 270. JUNE, 1911

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.94, 25th, 6 A.
Minimum reduced to freezing,	29.27, 14th, 3:30 P.
Reduced† maximum reading,	30.24, 25th, 6 A.
Reduced† minimum reading,	29.55, 14th, 3:30 P
Mean semi-daily reduced,	29.936
Monthly range,	0.69

***Air Temperature.** In Degrees Fahr.

Highest,	89.5, 28th, 3 P.
Lowest,	44.5, 17th, 5 A.
Mean hourly,	64.5
Mean of means of max. and min.,	64.4
Mean sensible (wet bulb),	59.4
Monthly range,	45.0
Highest mean daily,	76.3, 28th
Lowest mean daily,	56.0,. 13th
Mean maximum,	75.9
Mean minimum,	52.8
Mean daily range,	23.1
Greatest daily range,	36.0, 9th
Least daily range,	4.0, 7th

Humidity.

Mean dew point,	55.8
Mean force of vapor,	.618
Mean relative humidity,	74.5

Precipitation. In inches.

Total precipitation,	2.02
Number of days on which .01 inch or more rain fell,	11

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

Wind.

Total movement,	3546m
Greatest daily movement,	284 m., 1st
Least daily movement,	35m., 25th
Mean daily movement,	118.2 m
Mean hourly velocity,	4.9 m

Maximum pressure per square foot, 5.0 lbs.= 32m. per hour, 21st, 10 A., N.N.W.

Maximum velocity for 5 minutes, 24m. per hour, 2d, 4 P., W.N.W.

Prevailing Direction, North Northwest.

Summary.

North	20 per cent.
Northwest	17 " "
North Northwest	13 " "
West	13 " "
North Northeast	10 " "
Other directions	27 " "

Weather.

Mean cloudiness observed,	54 per cent.
Total cloudiness recorded by the Sun Thermometer,	177 hrs.=39 per cent.
Number of clear days,	9
Number of fair days,	13
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, 280 hrs.=61%

Rain, 1st, 3d, 5th, 6th, 7th, 10th, 11th, 12th, 13th, 14th. 20th, 22d, 25th, 26th, 28th.

Thunder and Lightning, 11th, 12th, 20th.

Gales, 35 or more miles per hour: None.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.82	29.60	29.697	72.0	9 A	55.0	12 P	63.5	62.8	57.7	12.0
2	30.05	29.82	29.936	78.5	3 P	50.5	5 A	64.5	65.2	58.0	14.0
3	30.18	30.05	30.138	72.0	5 P	48.0	4 A	60.0	60.5	54 5	11.5
4	30.23	30.14	30.202	81.0	4:30 P	45.5	5 A	63.3	65.3	60.0	14.0
5	30.21	30.13	30.142	61.5	9 A	54.0	12 P	57.7	56.5	53.5	1.7
6	30 14	30.11	30.132	59.5	5 P	53.5	1 A	56.5	56.1	54 5	3.0
7	30.23	30.14	30.182	59.0	4:30 P	55.0	12 P	57.0	60.0	52.0	5.8
8	30.23	30.07	30.132	81.0	5:30 P	47.0	5:30 A	64 0	65.1	60.5	14.2
9	30.07	29 89	29.970	84.5	5:30 P	48 5	5 A	66.5	68.5	62.7	13 8
10	29.92	29.73	29.824	82.0	3 P	57 5	5:30 A	69.7	71.1	68.0	10.3
11	29.93	29.78	29.824	74.0	1 P	57.0	12 P	65.5	66.4	61.7	6.3
12	29.93	29.80	29.855	65.5	3 P	52.5	12 P	59 0	57.2	54 5	0.5
13	29.87	29.64	29.752	66.5	5 P	51 0	6 A	58.7	56.0	55 5	2.2
14	29.64	29.55	29.607	73.5	3 P	57.5	3 A	65.5	64.5	60.0	6.2
15	29 70	29.62	29.666	75.0	4:30 P	55.0	12 P	65 0	64.1	58.3	10.0
16	29.81	29.69	29.752	71.0	11:30 A	51.0	12 P	61.0	60 1	52.7	10.8
17	29.86	29.81	29 855	78.0	2 P	44.5	5 A	61.3	62.5	57.3	12.1
18	29.89	29.82	29.870	81.5	4 P	48.0	5 A	64.7	66.0	59.7	14 0
19	29.93	29.81	29.888	85.0	3 P	53.0	5:30 A	69.0	70.8	63.7	14.0
20	29.82	29.67	29.764	80.0	12 M	57.0	12 P	68.5	67.1	57.7	11.8
21	29.98	29.82	29.910	73.0	5:30 P	50 5	5 A	61.7	61.1	54 7	12.3
22	29.98	29 77	29.877	77.0	12:30 P	46.0	5 A	61.5	60.7	59 7	7.0
23	30.02	29.76	29.864	81.5	3:30 P	51.0	5:30 A	66.3	67.5	60.3	12.1
24	30.20	30.02	30.126	82.5	6 P	47.0	5 A	64.7	65.7	57.5	12.5
25	30.24	30.15	30.200	71.0	6 P	47.5	5 A	59.3	59.9	56.3	6 6
26	30.15	29.98	30.058	72.0	3:30 P	55.5	2 A	63.7	64 2	61.5	3.5
27	29.98	29.84	29.892	78.5	4 P	65.0	0 A	71.7	71.5	68.7	3.7
28	29.95	29.83	29.865	89.5	3 P	69 0	6 A	79.3	76.3	71.3	10.3
29	30.09	29.95	30.029	83.5	3:30 P	59.0	5 A	71.3	70 7	61.3	13.5
30	30.11	30.03	30.077	86.0	5 P	55.0	5 A	70.5	70.7	62.5	10.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	54.5	.576	75.0	W.	284	2.0	20	2 P	0 A	3 A	.11	
2	52.0	.647	59.5	W.N.W.	234	4.0	28	3 P				
3	49 5	.532	67.5	W.	103	0.0	—	—	7 A	8 A	T	
4	56.0	.640	41.0	N.	85	1.0	14	7 P				
5	50.5	.474	81.0	W.	103	0.0	—	—	9 A	12 P	.21	
6	54.0	.440	94.0	N.N.E.	182	1.5	17	2 P	0 A	12 P	.50	
7	56.0	.490	91.5	E.N.E.	149	1.0	14	4 P	0 A	10 A	.12	
8	56.0	.656	69.5	N.	149	0.0	—	—				
9	58.5	.727	67.5	N.N.W.	79	0.0	—	—				
10	66.0	.800	79.5	W.S.W.	58	0.0	—	—	4 P	11 P	.01	
11	59.5	.642	80.5	E.	78	0.0	—	—	4 P	11 P	.15	
12	53.5	.460	88.0	N.N.E.	96	1.5	17	10 P	9 A	12 P	.58	
13	54.5	.463	93.0	N.W.	93	0.0	—	—	0 A	12 P	.08	
14	58.5	.569	85.5	W.	95	0.0	—	—	0 A	7 A	.07	
15	56.0	.547	81.0	N.N.W.	96	1.5	17	2 P				
16	46.5	.523	61.0	N.W.	137	1.5	17	1 P				
17	53.5	.575	69.5	N W.	115	0 0	—	—				
18	55.5	.628	71.5	S.W.	57	0.0	—	—				
19	58.5	.773	67.5	W.S.W.	95	0.0	—	—				
20	51.0	.640	61.0	N.N.W.	171	3.5	26	6 P	8 A	4 P	.06	
21	49.5	.531	66.0	N.N.W.	238	5.0	32	10 A				
22	57.0	.585	80.5	N.W.	56	0.0	—	—	12 M	7 P	.04	
23	53.0	.719	57.5	N.W.	115	0.0	—	—				
24	50.5	.657	56.0	N.	73	0.0	—	—				
25	53.5	.527	78.5	N.	35	0.0	—	—	6 A	10 A	T	
26	60.0	.603	87.0	N.	65	0.0	—	—	8 A	9 P	T	
27	67.0	.777	87.0	E.	58	0.0	—	—				
28	70.0	.830	87.5	W.N.W.	113	0.0	—	—	6 A	7 A	T	
29	56.0	.724	62.5	N.	157	0.0	—	—				
30	57.0	.776	60.5	N.N.E.	177	1.0	14	8 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was generally pleasant with comparatively few cloudy days. High temperature was but little in evidence although the weather could hardly be called cool. A light precipitation was perhaps the most abnormal feature.

A comparison of the several weather elements with the normals for this station shows the following as the more important characteristics of the month: The mean barometer was lower than the normal and the range less than usual. Changes in pressure were generally slow and of small range, On account of the steady barometric pressure the total wind movement was small and many days did not show any apparent pressure on the wind pressure chart. The wind was from the northwest points of the compass a large part of the time. Not a single gale was registered during the month.

The mean temperature was slightly lower than the normal; the maximum was rather less than usual and the minimum above the average value giving a small monthly range. On comparatively few dates was a temperature of 80 degrees or more reached so that there was but little oppressive weather.

The mean dew point was slightly below the normal and the relative humidity slightly more than the average.

The total precipitation was about six tenths of the normal and the greater part occurred the first half of the month. The deficiency in rainfall which has been steadily accumulating since the first of the year was augmented by nearly two inches.

The amount of bright sunshine recorded was nearly twenty per cent more than the normal.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 271. JULY, 1911

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 29.98, 8th, 8 A.
Minimum reduced to freezing, 29.24, 24th, 6 P.
Reduced† maximum reading, 30.26; 8th, 8 A.; 27th, 8 A.
Reduced† minimum reading, 29.52, 24th, 6 P.
Mean semi-daily reduced, ... 29.989
Monthly range, ... 0.74

***Air Temperature.** In Degrees Fahr.

Highest, ... 104.0, 4th, 3:30 P.
Lowest, ... 49.0, 26th, 5 A.; 27th, 5 A.
Mean hourly, ... 73.7
Mean of means of max. and min., ... 74.6
Mean sensible (wet bulb), ... 66.0
Monthly range, ... 55.0
Highest mean daily, ... 87.0,. 4th
Lowest mean daily, ... 60.4, 28th
Mean maximum, ... 87.8
Mean minimum, ... 61.5
Mean daily range, ... 26.3
Greatest daily range, ... 38.0, 1st
Least daily range, ... 4.0, 28th

Humidity.

Mean dew point, ... 61.7
Mean force of vapor, ...825
Mean relative humidity, ... 70.7

Precipitation. In inches.

Total precipitation, ... 4.21
Number of days on which .01 inch or more rain fell, ... 9

*Temperature in ground shelter.
† Reduced to freezing and sea-level.

Wind.

Total movement, ... 3878m
Greatest daily movement, ... 259 m., 24th
Least daily movement, ... 35m., 27th
Mean daily movement, ... 125.0m
Mean hourly velocity, ... 5.2m
Maximum pressure per square foot, 7.5 lbs.= 39m. per hour, 5th, 6 P., S.
Maximum velocity for 5 minutes, 30m. per hour, 5th, 5P., S.
Prevailing Direction, West Southwest.

Summary.

South	23 per cent.
West	19 " "
South Southwest	16 " "
Southwest	10 " "
West Southwest	10 " "
Other directions	22 " "

Weather.

Mean cloudiness observed, ... 42 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 165 hrs.=36 per cent.
Number of clear days, ... 9
Number of fair days, ... 15
Number of cloudy days, ... 7

Bright Sunshine.

Number of hours recorded, . . 297 hrs.=64%
Rain, 5th, 6th, 14th, 15th, 17th, 18th, 20th, 22d, 24th, 26th, 28th, 30th.
Thunder and Lightning, 5th, 6th, 14th, 15th, 24th.
Hail, 5th.
Gales, 35 or more miles per hour: 39 m, 5th, S.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.09	29.97	30.015	91.0	3:30 P	53.0	5 A	72.0	72.9	64.3	13.3
2	29.97	29.83	29.878	96.0	5 P	63.5	4:30 A	79.7	80.5	68.7	12.1
3	29.91	29.82	29.866	102.5	2 P	70.0	5 A	86.3	86.3	72.5	12.7
4	30.02	29.91	29.967	104.0	3:30 P	72.0	5:30 A	88.0	87.0	74.7	11.9
5	30 12	30.00	30.048	101.5	3 P	72.5	5:30 A	87.0	81.0	68.3	9.5
6	30.08	29.83	29.946	98.0	2 P	71.0	5 A	84.5	81.6	74.0	11.2
7	30.22	29.96	30.111	90.0	5 P	70.0	5 A	80.0	76.9	67.7	13.3
8	30.26	30.18	30:228	85.5	4:30 P	58.5	5:30 A	72.0	72.7	63.5	13.3
9	30.21	30.01	30.085	95.0	3 P	60.5	4:30 A	77.7	78.4	69.3	12.7
10	30.01	29.90	29.966	99.5	3:30 P	73.0	6 A	86.3	85.0	78.5	12.2
11	29.95	29.82	29.889	97.5	2 P	69 5	5 A	83.5	83.5	74.3	13.5
12	29.96	29 84	29.885	96.0	12:30 P	69.5	5 A	82.7	79.4	67.5	9 4
13	30 10	29.95	30.033	87.0	2 P	60.0	4:30 A	73.5	73.3	62.7	12.5
14	30.16	30.10	30.159	78.5	1:30 P	56.5	4 A	67.5	64.9	61.0	5.5
15	30.18	30.06	30.131	88.0	2:30 P	53.5	5:30 A	70.7	71.5	65.0	9.5
16	30.14	30.04	30.088	89.0	3:30 P	67.0	1:30 A	78.0	75.7	67.7	9.2
17	30.04	29.81	29.864	83.0	12 M	67.0	3 A	75.0	72.6	69.0	4.3
18	30.06	29.83	29.945	85.0	4:30 P	60 5	5 A	72.7	71.9	65.7	12.3
19	30.13	30.01	30.052	84.5	4:30 P	52.5	5 A	68.5	69.8	63.0	12.3
20	30.01	29.83	29.910	84.5	4 P	60.0	6 A	72.3	69 4	63.7	6.2
21	29.88	29.73	29.778	81.0	3 P	56.0	5:30 A	68.5	67.3	61.7	5.7
22	29.78	29.63	29.738	82.0	3 P	60.5	5 A	71.3	70.3	60.0	11.7
23	29.90	29.78	29.876	82.5	4 P	53.0	4 A	67.5	69.7	59.3	10.6
24	29.89	29.52	29.623	86.5	4 P	66.5	3 A	76.5	73.7	70.7	5.3
25	30.00	29.61	29.863	83.0	4 P	56.5	5 A	69.7	66.5	56.7	10.0
26	30.18	30.00	30.119	80.0	2:30 P	49.0	5 A	64.5	64.6	56.7	9.7
27	30 26	30.18	30.250	81.0	5 P	49.0	5 A	65.0	66.5	60.7	10.4
28	30.22	29.98	30.106	62.0	8 A	58.0	10 A	60.0	60.4	59.5	0.0
29	30.10	30.02	30.075	80.5	3.30 P	58.5	3 A	69.5	68 5	65.0	5.7
30	30.14	30.06	30.115	76.5	2 P	63.0	12 P	69.7	69.8	67.3	0.8
31	30.11	30.03	30.065	90.0	4 P	57.5	3 A	73.7	73.0	65.3	10.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	59.0	.817	62.5	N.N.E.	79	0.0	—	—				
2	63.0	.989	59.0	W.S.W.	97	0.0	—	—				
3	67.0	1.182	57.0	W.	89	0.0	—	—				
4	70.0	1.193	63.0	W.S.W.	142	0.0	—	—				
5	62.5	.996	63.5	S.	125	7.5	39	6 P	4 P	6 P	1.07	
6	71.5	.995	79.5	W.	182	4.0	28	7 P	6 P	11 P	.04	
7	63.5	.875	68.0	N.N.E.	128	0.5	10	10 A				
8	57.0	.812	59.0	S.	167	0.0	—	—				
9	63.5	.964	64.0	S.W.	154	0.0	—	—				
10	75.0	1.175	77.5	S.W.	91	2.0	20	2 P				
11	70.0	1.177	62.5	W.	95	0.0	—	—				
12	65.5	.926	69.0	W.S.W.	111	0.0	—	—				
13	55.0	.839	53.0	N.W.	136	0 0	—	—				
14	59.0	.589	85.5	W.	43	0.0	—	—	1 P	5 P	.07	
15	61.0	.782	69.0	S.	146	1.0	14	1 P	7 P	8 P	T	
16	64.5	.817	75.5	S.	205	1.0	14	2 P				
17	66.0	.820	81.0	S.	161	1.0	14	1 P	9 A	5 P	.01	
18	62.0	.789	70.5	N.N.W.	135	0.5	10	2 P	1 A	5 A	.04	
19	57.5	.755	64.0	W.	69	0.0	—	—				
20	61.5	.657	85.5	S.S.W.	105	0.0	—	—	8 A	9 P	T	
21	59.5	.645	80.5	S.S.W.	79	0.5	10	4 P				
22	53.5	.714	58.0	N W.	146	1.0	14	4 P	3 A	5 A	.13	
23	51.0	.720	54.0	W.	146	1.0	14	11 A				
24	69.5	.840	85.0	S.S.W.	259	3.5	26	4 P	7 A	10 P	2.02	
25	49.0	.650	54.5	W.	242	1.5	17	9 A				
26	51.0	.577	66.5	S.S.W.	119	2.0	20	4 P	3 P		T	
27	58.0	.629	78.0	N.N.W.	35	0.0	—	—				
28	58.5	.542	89.5	N.	152	1.0	14	6 P	8 A	12 P	.69	
29	62.5	.717	81.5	S.S.W.	117	0.0	—	—				
30	66.5	.717	90.5	S.	72	0.0	—	—	7 A	4 P	.05	
31	63.0	.715	84.5	S.	51	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The excessively high temperature was easily the most important characteristic of the month just closed, and calls for more than passing comment. The temperature records of this station go back to 1889, and the records of the late Professor Snell of Amherst college carry us back as far as 1837. Previous to this year the maximum temperature record exceed 100° Fahr. but once—in 1901, when 100.5° was recorded—while on three successive days during the past month more than 100° was registered, and the highest record of 104° reached on July 4th will without doubt long remain the maximum temperature record for this station.

The mean temperature for the month, computed from the daily maximum and minimum records shows a higher value than any month since the beginning of the records in this town in 1837. The maximum and minimum records are used as being the fairest for comparison with the early temperature records.

The mean temperature for the month, as explained above, was 74.6 degrees Fahr. Other high monthly records are July, 1839, 74.4°; July, 1854, 74.1°; July, 1868, 74.0°. No other month than July has any mean temperature record as high as 72.0°. The normal mean temperature for July is slightly over 70 degrees. The mean daily records on the 3d and 4th of 86.3° and 87.0° are so exceptional that they should be especially mentioned.

The mean barometer was practically normal, and the range but little more than usual. The total wind movement was about 10 per cent more than the normal and a large amount was from the southwest quadrant.

The mean dewpoint was about normal, but the relative humidity was unusually low for July.

The total precipitation was the largest for several months, although it was more than half an inch smaller than the normal. Several good rainstorms occurred, that of the 24th being especially heavy, having nearly two inches, and almost all of it falling in less than two hours. The rain on the 28th, while not especially heavy, was of much benefit to the growing crops.

The amount of bright sunshine was exceptionally large.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 272. AUGUST, 1911

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.01, 30th, 8 P.
Minimum reduced to freezing,	29.25, 16th, 2 A.
Reduced† maximum reading,	30.30, 30th, 8 P.
Reduced† minimum reading,	29.54, 16th, 2 A
Mean semi-daily reduced,	30.020
Monthly range,	0.76

***Air Temperature.** In Degrees Fahr.

Highest,	94.5, 10th, 3 P
Lowest,	44.5, 21st, 6 A
Mean hourly,	67.8
Mean of means of max. and min.,	68.5
Mean sensible (wet bulb),	62.2
Monthly range,	50.0
Highest mean daily,	77.3, 10th
Lowest mean daily,	54.6, 31st
Mean maximum,	80.1
Mean minimum,	57.0
Mean daily range,	23.1
Greatest daily range,	40.0, 14th
Least daily range,	3.0, 31st

Humidity.

Mean dew point,	59.0
Mean force of vapor,	.657
Mean relative humidity,	77.5

Precipitation. In inches.

Total precipitation,	5.92
Number of days on which .01 inch or more rain fell,	10

Wind.

Total movement,	3029m
Greatest daily movement,	207 m., 19th
Least daily movement,	28m., 26th
Mean daily movement,	98.0m
Mean hourly velocity,	4.1m
Maximum pressure per square foot,	3.0 lbs.= 24m. per hour, 16th, 9 A., N. W.
Maximum velocity for 5 minutes,	24m. per hour, 16th, 9A., N.W.
Prevailing Direction,	West Southwest.

Summary.

West	16 per cent.
Northwest	16 " "
South	13 " "
South Southeast	13 " "
South Southwest	10 " "
North Northwest	10 " "
Other directions	22 " "

Weather.

Mean cloudiness observed,	61 per cent.
Total cloudiness recorded by the Sun Thermometer,	202 hrs.=47 per cent.
Number of clear days,	7
Number of fair days,	16
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, . . 227 hrs.=53%

Rain, 1st, 11th, 15th, 17th, 18th, 24th, 25th, 27th, 28th, 29th, 31st.

Thunder and Lightning, 18th, 28th, 29th.

Gales, 35 or more miles per hour: None.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.10	30.02	30.056	90.0	1:30 P	61.0	4:30 A	75 5	74.5	67.3	12.3
2	30.21	30.10	30.178	82.5	3 P	61.0	6 A	71.7	69.8	63.7	8.5
3	30 22	30.13	30.199	77.5	3 P	62.5	6:30 A	70 0	68.8	63.0	5.7
4	30.16	30.04	30.106	82.5	4:30 P	62.0	6 A	72.3	70.3	62.7	8.5
5	30.06	29.98	30.024	84.5	4:30 P	59 5	4 A	72.0	71.0	65.3	7.5
6	30.08	29 97	30.040	87.5	3 P	59.5	5 A	73 5	73.8	66 7	10 4
7	30.09	29.96	30.035	86.0	3 P	61.0	5:30 A	73.5	73 7	66.3	11.0
8	30 02	29.88	29.971	86.0	3 P	64.0	5 A	75 0	72.2	65.3	7.1
9	29.98	29.89	29.934	86.5	4 P	66.0	2 A	76.2	74.8	69 0	8.5
10	30 07	29.97	30.043	91.5	3 P	58.5	5:30 A	76.5	77.3	68.7	10.0
11	30.11	29.89	29.980	82.5	2:30 P	60.0	12 P	71.3	71.5	65.3	1.1
12	30.21	30.11	30.155	82.5	2 P	50.0	6 A	66.3	66.5	59 7	10.8
13	30.16	29 98	30.052	83.0	3 P	51.0	5:30 A	67.0	67.0	67.0	10.2
14	30.04	29 88	29.984	91.0	4 P	51.0	6 A	71.0	72.0	61.3	12.0
15	29.91	29.55	29.729	89.5	12:30 P	54.0	5:30 A	71.7	69.0	65.0	6.6
16	29 73	29.54	29.658	84.0	3 P	61 5	5:30 A	72.7	71.8	61.3	11.5
17	29.79	29.70	29 742	84.0	4 P	58.5	5:30 A	71.3	71.5	63 0	11.3
18	29.80	29.59	29.715	83.0	1 P	55.0	5:30 A	69 0	65.4	60.7	6.8
19	29.85	29 59	29 759	74 5	3 P	57.0	6 A	65.7	64.2	57.5	10.3
20	30 01	29.85	29 954	76.0	6 P	46.0	6 A	61.0	61.3	54.3	11.5
21	30.14	30.01	30.116	80.5	4 P	44.5	6 A	62.5	63.5	65.3	12.0
22	30.15	30.03	30.101	81.5	3:30 P	52.5	5 A	67.0	67.1	61.0	11.3
23	30.09	29 95	30.030	83.0	3:30 P	53.0	5:30 A	68.0	68.0	60.7	6.9
24	30.18	30.09	30 156	72.0	2 P	52.0	6 A	62.0	63.7	58.0	5.4
25	30.14	30.05	30.078	62.0	12 M	58.0	7 A	60.0	59 4	58.0	0.0
26	30.17	30.03	30.106	79.0	3:30 P	58.0	0 A	68.5	67.2	63.7	5.6
27	30.22	30.15	30.194	67.0	2 P	62.5	12 P	64.7	65.0	62.5	0.0
28	30 15	29.90	29.995	79.5	3:30 P	62.0	6 A	70.5	69.0	67.7	1.1
29	30 18	29.90	30.054	69 0	0 A	57.0	12 P	63.0	63.1	62 7	0.0
30	30.30	30.18	30.284	66.5	3.30 P	54.0	6 A	60.3	59.0	52.3	2.6
31	30.29	30.02	30.177	56.5	0 A	53.5	12 P	55.0	54.6	53.3	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	64 5	.801	76.5	S.E.	40	1.0	14	1 P	1 P	2 P	.05	
2	62.0	.654	86.5	S.S.E.	86	0.0	—	—				
3	62.5	.698	75.0	S.S.E.	120	0.0	—	—				
4	59.5	.684	73.5	S.	93	0.0	—	—				
5	63.0	.722	82.0	S.	72	0.0	—	—				
6	62.0	.798	70.0	S.S.E.	85	0.0	—	—				
7	63.0	.077	76.5	S.	89	0.0	—	—				
8	63.0	.706	83.5	S.	158	0.0	—	—				
9	66.5	.829	79.0	S.S.W.	161	0.0	—	—				
10	65.5	.877	72.0	W.	53	0.0	—	—				
11	62.0	.750	75.0	W.	108	0.0	—	—	10 A	2 P	.02	
12	55 5	.620	73.5	N.N.W.	81	0.0	—	—				
13	52.5	.592	68.0	W.S.W.	58	0.0	—	—				
14	56.0	.714	64.0	S.W.	80	0.5	10	10 A				
15	63.0	.703	82.5	W.	106	1.0	14	3 P	2 P	10 P	1.41	
16	55.0	.735	59.5	N.N.W.	176	3.0	24	9 A				
17	59 0	.732	67.5	N.N.W.	92	0.0	—	—	3 A	4 A	.13	
18	58.5	.611	81.5	W.	98	3.0	24	2 P	1:30 P	8:30 P	.49	
19	52.5	.582	70.5	N W.	207	2.0	20	3 A				
20	50.0	.509	71.0	N.W.	73	0.0	—	—				
21	50.5	.544	69.0	W.	62	0.0	—	—				
22	58.0	.620	80 0	S.S.W.	196	1.0	14	1 P				
23	57.5	.641	74.5	N.W.	114	0.5	10	3 P				
24	53 0	.591	70.5	N.W.	46	0.0	—	—	5 P	12 P	T	
25	57.0	.510	90 5	S.S.E.	31	0.0	—	—	0 A	12 P	.72	
26	63.0	.634	91.0	N.	28	0 0	—	—				
27	61.5	.593	92.5	E.S.E.	56	0.0	—	—	4:30 A	12 P	.46	
28	67.0	.733	92.0	S.S.W.	113	3.0	24	4 P	0 A	12 P	.69	
29	67.5	.602	96.0	N.W.	140	0.0	—	—	0 A	11:30 P	1.24	
30	48.5	.463	73.0	N.E.	95	0.0	—	—				
31	52.0	.438	86.5	N.E.	112	0.5	10	11 P	3 A	4 P	.71	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The first two weeks of the month were practically devoid of precipitation, with temperatures slightly higher than the average of the month. On the 15th a heavy rainfall occurred, which practically broke the drought which had prevailed for a considerable period. Rain fell on the 16th and 17th, and the last week was stormy most of the time. The most characteristic feature was the large precipitation.

A comparison of the records with the normals of this station shows the following features: The mean barometer was slightly higher than the normal and the range somewhat greater than usual. Fluctuations in pressure were generally small and unimportant. The total wind movement was about normal, but an unusually large number of days showed no pressure on the "Force of Wind" chart. Most of the wind was from the southwest quadrant.

The maximum temperature was nearly four degrees above the normal value and the minimum was slightly higher than the normal, giving a range a little greater than usual. The mean temperature was practically normal.

The mean dew point and relative humidity were both about normal.

The total precipitation was about forty per cent more than the average. It was the first time during the current year that the precipitation record was above the monthly normal.

The amount of bright sunshine recorded was very nearly the usual amount, but the last week was unusually cloudy.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 273. SEPTEMBER, 1911

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.12, 23d, 8 A.
Minimum reduced to freezing, 29.27, 12th, 11 A.
Reduced† maximum reading, 30.41, 8th, 11 A.; 23d, 8 A.
Reduced† minimum reading, 29.56, 12th, 11 A
Mean semi-daily reduced, ... 30.060
Monthly range, ... 0.85

***Air Temperature.** In Degrees Fahr.

Highest, ... 84.0, 2d, 2 P
Lowest, ... 29.0, 14th, 6 A
Mean hourly, ... 60.2
Mean of means of max. and min., ... 60.4
Mean sensible (wet bulb), ... 55.4
Monthly range, ... 55.0
Highest mean daily, ... 71.4, 2d
Lowest mean daily, ... 41.0, 29th
Mean maximum, ... 71.4
Mean minimum, ... 49.3
Mean daily range, ... 22.1
Greatest daily range, ... 38.0, 14th
Least daily range, ... 4.0, 9th

Humidity.

Mean dew point, ... 52.9
Mean force of vapor, ...511
Mean relative humidity, ... 82.4

Precipitation. In inches.

Total precipitation, ... 3.41
Number of days on which .01 inch or more rain fell, ... 11

Wind.

Total movement, ... 3809m
Greatest daily movement, ... 263 m., 6th
Least daily movement, ... 31m., 9th
Mean daily movement, ... 127.0m
Mean hourly velocity, ... 5.3m
Maximum pressure per square foot, 5.0 lbs.= 32m. per hour, 16th, 8 P., N.N.E.
Maximum velocity for 5 minutes, 24m. per hour, 6th, 7A., S.S.W.
Prevailing Direction, Northwest.

Summary.

North Northwest	17 per cent.
West	17 " "
South Southwest	13 " "
South	10 " "
North	10 " "
Northeast	10 " "
Other directions	23 " "

Weather.

Mean cloudiness observed, ... 53 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 180 hrs.=48 per cent.
Number of clear days, ... 6
Number of fair days, ... 15
Number of cloudy days, ... 9

Bright Sunshine.

Number of hours recorded, . . 195 hrs.=52%

Rain, 6th, 8th, 9th, 11th, 12th, 15th, 21st, 22d, 25th, 26th, 27th, 29th.
Sleet, 29th.
Frosts, 14th, 27th.
Thunder and Lightning, 9th, 25th.
Gales, 35 or more miles per hour: None.

* Temperature in ground shelter.
† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.04	29.96	30 004	78.0	3:30 P	53.0	5:30 A	65.5	63.8	58.7	9.4
2	30.04	29.80	29.926	84.0	2 P	58.0	5:30 A	71.0	71.4	66.0	9.2
3	30 12	29.80	29.960	79.0	1:30 P	53.0	12 P	66.0	69.5	59.0	10.6
4	30.23	30.12	30.199	78.5	3:30 P	46.0	6:30 A	62.3	60.7	54.7	11.0
5	30.20	29 96	30.088	76.0	1:30 P	47.0	6:30 A	61.5	63.2	58.5	7.7
6	29.99	29.67	29.780	80.0	3 P	62 0	12 P	71.0	70.4	66.0	5.0
7	30.25	29 99	30.192	62.0	4 P	56 5	2:30 A	59.3	58.8	53.7	0.0
8	30.41	30.25	30.385	58.0	0 A	53 0	9 A	55.5	55.8	52.5	0.0
9	30.39	30.08	30.208	58.5	8 P	54.5	8 A	56.7	56 2	55 7	0.0
10	30 08	29.91	29.968	81.0	3 P	57.0	6 A	69 0	65.1	59.3	7.7
11	29.91	29.70	29.840	74 0	3:30 P	52.0	6 A	63.0	62.5	60.5	3.3
12	29 84	29.56	29.673	75.5	3 P	52.0	12 P	63.7	65.9	61.5	6.7
13	30.23	29.84	30.063	55.5	3:30 P	37.0	12 P	46.3	47.8	44.3	9.2
14	30.36	30.23	30.334	67.0	3 P	29.0	6 A	48.0	47.7	43.0	10.5
15	30.32	29 98	30.115	62.0	12 P	38.5	5 A	50.3	52.2	50.7	0 0
16	29.98	29.86	29.927	81.0	5 P	60.0	5 A	70.5	66.0	60.7	7.2
17	30.14	29.92	30.076	72.0	3:30 P	52 5	6 A	62.3	63.2	58.0	8.8
18	30.16	29.99	30.095	75.5	4 P	51 5	6 A	63.5	61.7	57.7	7.7
19	29.99	29.78	29.869	80.5	4:30 P	53.5	4 A	67.0	65.5	60.3	8.9
20	30.13	29 86	29 979	79.5	2 P	52.5	6 A	66.0	64.2	58.3	9.6
21	30.27	30.13	30.204	77.0	2:30 P	44.0	6 A	60.5	60.8	56.3	8.3
22	30.36	30.08	30.202	80.0	2 P	54 5	12 P	67.3	66.3	60.0	8.9
23	30.41	30.27	30.356	77.0	3:30 P	50 0	6:30 A	63 5	61.7	55.3	10.1
24	30.27	30.03	30.144	78.0	3.30 P	57.0	2 A	67.5	65.6	62.0	6.3
25	30.07	29.88	29.969	81.5	2 P	64.0	6 A	72.7	69.8	66.5	5.2
26	30.23	29.95	30.106	66.0	0 A	43.0	12 P	54.5	58.6	52.0	4.3
27	30.26	29.87	30.089	59.5	12 P	34.5	7 A	47.0	49 3	47.5	0.5
28	30.20	29.87	30.110	60.0	0 A	37.5	12 P	48.7	52.0	44.0	9.8
29	30.17	19 66	29.853	45.0	8 P	35.0	2 A	40.0	41.0	41.3	0.0
30	30.24	29.98	30.085	61.0	4 P	40.0	12 P	50.5	48.5	42.7	9.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	55.0	.594	74.0	W.	110	0.0	—	—				
2	63.5	.746	80.5	S.S.W.	165	1.0	14	10 A				
3	53.5	.674	62.0	N.N.W.	180	0.5	10	11 A				
4	52.0	.486	80.5	W.N.W.	56	0.0	—	—				
5	55.5	.580	78.5	S.S.W.	145	0.5	10	1 P				
6	64.0	.730	82.5	W.	263	3.0	24	7 A	3:30 A	8 A	.37	
7	49 5	.493	72.5	N.N.E.	88	0.0	—	—				
8	50.5	.430	85.0	N.E.	50	0.0	—	—	6:30 A	10:30 P	.13	
9	54 5	.458	94.0	E.	31	0.0	—	—	6 A	9 P	.76	
10	58.0	.535	90.5	N W.	49	0.0	—	—				
11	59.5	.556	90.5	S.S.W.	80	0.5	10	12 M	9 A	11 A	.04	
12	60.0	.585	89.5	W.	229	2.5	22	12 M	7 A		T	
13	39.5	.338	73.5	N.	184	2.0	20	5 P				
14	39.0	.307	78.5	W.	52	0.0	—	—				
15	49.0	.410	89.5	S.	171	3.0	24	1 P	9 A	8 P	.47	
16	59.0	.587	86.0	W.	62	5.0	32	8 P				
17	55.0	.550	80.0	N.E.	171	1 0	14	3 P				
18	55.5	.519	87.5	N.E.	129	0.5	10	8 A				
19	58.0	.584	84.0	N.N.E.	99	0.0	—	—				
20	56 5	.531	86.5	N.N.E.	88	0.5	10	3 P				
21	53.0	.537	76.0	E.	94	0.0	—	—	10 P	12 P	.03	
22	57.0	.595	80.0	N.N.W.	136	1.0	14	3 P	0 A	4 A	.59	
23	51 5	.509	76.5	S.	63	0.5	10	12 M				
24	60.5	.606	88.0	S.	122	0.0	—	—				
25	66.0	.678	94.0	S.W.	183	1.0	14	11 A	4 P	10 P	.06	
26	47.0	.450	77.0	N.	147	4.5	30	4 P	2 A	8 A	.08	
27	45.5	.360	89.0	S.S.W.	139	1.0	14	8 P	3 P	8 P	.13	
28	40.0	.333	76 5	N.N.E.	204	3.0	24	8 A				
29	40.5	.268	94.0	N.N.E.	75	0.0	—	—	6 A	7 P	.75	
30	38.5	.314	75.5	N.	244	4.5	30	1 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month showed no abnormal features of importance. The first frost of the season, about the middle of the month, while but a few days earlier than usual, caused considerable damage on account of its severity. Other features not so noticeable were the high relative humidity and dewpoint.

The minor departures from the normals found by comparing the records of the month with previous September records here are as follows: The mean barometer was slightly lower than the normal and the range a few hundredths less than usual. Both the maximum and minimum for the month were below average values.

The total wind movement was about 500 miles more than the September average, but no gales were recorded on the wind pressure chart. The prevailing direction of the wind was around to right of the more usual positions.

The mean temperature was about a degree below the normal and the range was the average value. The maximum temperature was about four degrees below the normal, and the minimum was nearly the same amount below the mean value of the September minima,

The mean relative humidity was about 6 points higher than the normal and the mean dewpoint about one per cent greater than the average.

The total precipitation was nearly an inch less than the September mean. No heavy storms were noted. The records show that it was fairly well distributed throughout the month.

The amount of sunshine was nearly normal.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 274. OCTOBER, 1911

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.28, 25th, 8 A.
Minimum reduced to freezing,	29.26, 4th, 6 P.
Reduced† maximum reading,	30.59, 25th, 8 A.
Reduced† minimum reading,	29.55, 4th, 6 P.
Mean semi-daily reduced,	30.115
Monthly range,	1.04

***Air Temperature.** In Degrees Fahr.

Highest,	72.5, 9th, 3 P.; 16th, 3:30 P.
Lowest,	24.0, 29th, 7 A
Mean hourly,	48.5
Mean of means of max. and min.,	49.0
Mean sensible (wet bulb),	43.7
Monthly range,	48.5
Highest mean daily,	57.6, 22d
Lowest mean daily,	36.1, 28th
Mean maximum,	59.9
Mean minimum,	38.1
Mean daily range,	21.8
Greatest daily range,	37.5, 10th
Least daily range,	5.5, 19th

Humidity.

Mean dew point,	40.1
Mean force of vapor,	.327
Mean relative humidity,	79.0

Precipitation. In inches.

Total precipitation,	8.81
Number of days on which .01 inch or more rain fell,	12

Wind.

Total movement,	3451m
Greatest daily movement,	288 m., 5th
Least daily movement,	46m., 10th
Mean daily movement,	111.0 m
Mean hourly velocity,	4.6 m

Maximum pressure per square foot, 6.0 lbs.= 35m. per hour, 5th, 10 A., N.W.

Maximum velocity for 5 minutes, 24m. per hour, 24th, 9A., N.W.

Prevailing Direction, West Northwest.

Summary.

West	13 per cent.
South Southwest	13 " "
North	16 " "
South	10 " "
Northwest	10 " "
Other directions	38 " "

Weather.

Mean cloudiness observed,	59 per cent.
Total cloudiness recorded by the Sun Thermometer,	217 hrs.=64 per cent.
Number of clear days,	1
Number of fair days,	14
Number of cloudy days,	16

Bright Sunshine.

Number of hours recorded, 124 hrs.=36%

Rain, 1st, 2d, 4th, 6th, 7th, 11th, 17th, 18th, 19th, 21st, 22d, 23d, 27th, 31st.

Frosts, 7th, 14th, 25th, 28th, 29th.

Gales, 35 or more miles per hour: 35 m, 5th, N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.26	29.87	30.094	54.5	2 P	38.5	1 A	46.5	45.9	43.3	0 0
2	30 12	29.80	29.942	56.5	5 P	43.0	12 P	49.7	47.6	45.5	1.8
3	30.30	30.12	30.257	62.5	4 P	35.5	7 A	49.0	47.6	42.3	9.5
4	30.16	29.55	29 719	67.0	8:30 A	47.0	0 A	57 0	56.7	56.7	0.0
5	30.13	29.67	29.971	60.0	3 P	42.0	12 P	51.0	53.5	46.0	5.8
6	30.22	29.97	30.093	52.5	2 P	37.5	12 P	45.0	43.9	39 0	3.6
7	30.23	29.93	30.053	51.5	5 P	35.0	9 A	43.3	39.5	36.5	1.2
8	30.32	30.17	30.236	63.0	4 P	28.0	6:30 A	45.5	43 8	35.7	8.7
9	30.27	30.10	30.190	72.5	3 P	36.5	6 A	54.5	52.5	40 5	8.2
10	30.37	30.20	30.290	71.5	3:30 P	34.0	5:30 A	52.7	51.5	44.7	9.2
11	30.20	29 96	30.060	62.0	3:30 P	41.5	6:30 A	51.7	52.1	50.0	0.0
12	29.96	29.71	29.812	69.0	4 P	41.0	7:30 A	55.0	55.5	48 0	5 9
13	30.07	29.88	29.994	58.0	1:30 P	31.0	6:30 A	44 5	45.3	39.3	8 9
14	30.16	30 07	30.141	64.5	3 P	30.0	7 A	47.3	47.6	41.0	8 3
15	30 18	30.03	30.111	67.5	3 P	36.5	7:30 A	52 0	50.0	43 5	5.0
16	30.14	30.04	30.108	72 5	3:30 P	42.0	7 A	57.3	52 7	44.3	6.5
17	30.25	30.06	30.170	54.0	8:30 P	38.0	5 A	46.0	48 6	47.5	0.0
18	30 06	29 91	29.966	56.0	9 P	49 5	6:30 A	52.7	53.3	49 0	0 0
19	30.17	29.96	30.133	58.5	1 P	53 0	12 P	55 7	55.1	53.0	0.0
20	30.25	30.16	30.228	57.0	4 P	49.0	8:30 P	53.0	52.5	48 7	0.0
21	30.26	30.11	30 203	53.5	12 P	47.5	6 A	50.5	51.1	49.7	0.0
22	30.11	29.88	30.032	61.5	8 P	53 0	8 A	57.3	57.6	56.5	0.0
23	30.04	29.83	29.988	63.0	3 P	39.5	12 P	51.3	52.7	45.3	6.3
24	30.50	30 04	30.315	59.0	2 P	32 0	6:30 A	45.5	45.0	38.3	7 5
25	30.59	30.30	30.479	60.0	3 P	28.5	6 A	44.3	43 7	37.5	8.0
26	30.30	30.14	30.230	63.0	3 P	32.5	6:30 A	47.7	45.6	39.5	3.7
27	30.19	30.08	30.142	47.0	2:30 P	35 0	6 A	41.0	41.5	38.5	0.0
28	30 33	30 20	30.269	46.5	4 P	28 0	7:30 A	37 3	36.1	28 0	3.3
29	30 20	29.99	30.081	56.5	3 P	24.0	7 A	40.3	39.5	31.7	7.3
30	30.19	30.03	30.151	59.0	3 P	35.0	6:30 A	47.0	46.7	41 0	5.6
31	30.19	30.01	30.094	57.5	3 P	37.5	6 A	47.5	47.6	46.0	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	41.0	.294	90.5	S.W.	37	0.0	—	—	4 P	12 P	.64	
2	43.5	.322	89.5	N.	215	2.5	22	3 P	0 A	9 A	.22	
3	39.0	.298	81.5	W.N.W.	138	0.0	—	—				
4	54.5	.509	88.0	S.S.W.	263	5.0	32	8 A	4 A	8 P	.61	
5	40.5	.375	68.0	N.W.	288	6.0	35	10 A				
6	33.5	.269	75.0	N N.E.	86	1.5	17	8 P	6 P	12 P	.09	
7	34.0	.234	83.5	N.	168	1 0	14	12 M	0 A	9 A	.37	
8	30.5	.260	68.0	N.	54	0.0	—	—				
9	45.0	.388	77.5	S.W.	70	0.0	—	—				
10	40.5	.338	78.5	N.N.W.	46	0.0	—	—				
11	49.0	.380	95.0	S.	50	0.0	—	—	10 A	12 M	T	
12	44.5	.374	70 5	S.	116	2.0	20	7 P				
13	30.5	.299	58.5	N.	252	3.5	26	2 P				
14	35.5	.307	71.0	W.S.W.	76	0.0	—	—				
15	41.5	.310	86 5	S.	71	0.0	—	—				
16	40.5	.324	77.5	W.	25	0.0	—	—				
17	46.5	.351	90.0	E.S.E.	54	0.0	—	—	6 P	8 P	.03	
18	45.0	.406	76.0	E.	144	0.5	10	12 M	5 A	12 P	3.45	
19	52.5	.424	91.0	N.N.E.	111	0.0	—	—	0 A	2 P	1.20	
20	47.0	.375	85.5	E.N.E.	105	0 0	—	—				
21	48.5	.378	90.5	E.N.E.	78	0.0	—	—	8:30 A	12 P	1.25	
22	56.0	.479	96.0	S.E.	108	1.5	17	10 P	0 A	12 P	.37	
23	42.5	.339	79 5	N.W.	179	1.0	14	1 A	0 A	6 A	.51	
24	31.0	.278	62.5	N.W.	153	3.5	26	9 A				
25	33.5	.259	74 5	W.	73	0.0	—	—				
26	36 5	.275	81.0	W.	61	0.0	—	—				
27	34.5	.263	77.0	N.	67	0.0	—	—	1:30 P	3 P	T	
28	20.5	.178	63.0	W.	70	0 0	—	—				
29	24.5	.220	61.5	S.S.W.	104	0.0	—	—				
30	35.5	.301	69.0	S.S.W.	81	0.0	—	—				
31	45 5	.329	93.0	S.S.W.	78	0.5	10	3 P	6 A	12 P	.07	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the past month was marked by an unusually large amount of rainfall and an accompanying excessive percentage of cloudiness. Following a number of months showing generally a considerable deficiency in precipitation, the heavy rainfall did much toward replenishing rapidly failing water supplies and restoring the amount of ground water to nearly a normal condition. A generally high barometer, with frequent shifting of wind and a comparatively small wind movement, was also a noticeable feature.

A study of the records of the several weather elements of the month shows the following as the more important features: The mean barometer was considerably above the normal and the range of pressure less than the average value for October. While the maximum pressure was nearly normal, the minimum was considerably greater than the average minimum value.

The maximum temperature was nearly seven degrees lower than the normal value of this record for October while the minimum record was about the average value, giving an unusually small value for the range at this season of the year. The mean temperature was practically normal notwithstanding the general impression that the month was colder than usual.

While the mean dew point was rather low, the relative humidity was about five per cent above the normal.

The total precipitation was nearly two and one-half times the normal and was fairly well distributed throughout the month. The heaviest rainfall occurred during the storm of the 18th-19th when more than one-half the total for the month fell. The total was the largest October record ever made at this station, and the only monthly records showing a larger precipitation here are those of July, 1889, with a record of 10.52 inches, and July, 1897, with a record of 14.51 inches.

Combining our records with those of Professor Snell of Amherst College we find that not since 1869 has the precipitation for October been as large as during the month just closed,

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Acting Observer.

BULLETIN No. 275. NOVEMBER, 1911

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30.17, 4th, 9 A.
Minimum reduced to freezing, 28.93, 18th, 12 M.
Reduced† maximum reading, 30.48, 4th, 9 A.
Reduced† minimum reading, 29.24, 18th, 12 M.
Mean semi-daily reduced, ... 30.009
Monthly range, ... 1.24

***Air Temperature.** In Degrees Fahr.

Highest, ... 66.5, 12th, 2 P.
Lowest, ... 18.5, 23d, 7 A.
Mean hourly, ... 36.7
Mean of means of max. and min., ... 37.2
Mean sensible (wet bulb), ... 32.3
Monthly range, ... 48.0
Highest mean daily, ... 55.4, 12th
Lowest mean daily, ... 28.3, 22d
Mean maximum. 46.0
Mean minimum, ... 28.4
Mean daily range, ... 17.6
Greatest daily range, ... 34.0, 12th
Least daily range, ... 4.0, 10th

Humidity.

Mean dew point, ... 27.4
Mean force of vapor, ...214
Mean relative humidity, ... 73.5

Precipitation. In inches.

Total precipitation, ... 3.84
Number of days on which .01 inch or more rain fell, ... 12
Total snow in inches 1.0

Wind.

Total movement, ... 5950m
Greatest daily movement, ... 477m., 12th
Least daily movement, ... 60m., 5th
Mean daily movement, ... 198.0 m
Mean hourly velocity, ... 8.3 m
Maximum pressure per square foot, 15.0 lbs.= 55m. per hour, 12th, 6 P., S.W.
Maximum velocity for 5 minutes, 36m. per hour, 12th, 2P., S.W.
Prevailing Direction, West.

Summary.

West Northwest . . . . . 13 per cent.
Northwest . . . . . 13 " "
West Southwest . . . . . 10 " "
Southwest . . . . . 10 " "
South Southwest . . . . . 20 " "
Northeast . . . . . 10 " "
Other directions . . . . . 24 " "

Weather.

Mean cloudiness observed, ... 60 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 219 hrs.=75 per cent.
Number of clear days, ... 1
Number of fair days, ... 9
Number of cloudy days, ... 20

Bright Sunshine.

Number of hours recorded, . . 74 hrs.=25%

Rain, 1st, 6th, 7th, 9th, 10th, 12th, 14th, 15th, 18th, 20th, 24th, 28th.

Snow, 14th, 15th, 16th, 18th, 20th, 21st.

Gales, 35 or more miles per hour: 40 m, 2d, N.N.W.; 39 m. 7th, W.S.W.; 55 m, 12th, S.W.; 41 m, 13th, W.N.W.; 36 m, 16th, N.W.

*Temperature in ground shelter.
†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	29.95	30.037	52.0	0 A	35.0	12 P	43.5	44.5	41.5	0.3
2	30.39	30.12	30.267	43.0	1 P	27.0	6:30 A	35.0	32.1	27.3	1.6
3	30.47	30.39	30.458	44.5	2 P	26.0	5:30 A	35.3	33.3	30.7	1.0
4	30.48	30.35	30.408	51.0	3 P	25.0	7 A	38.0	36.5	30.7	2.2
5	30 44	30.37	30.413	55.0	3:30 P	28.0	3 A	41.5	37.6	30.5	4.7
6	30.44	29.80	30.202	49.0	3 P	26.0	6 A	37.5	37.5	34.3	0.5
7	29.80	29 44	29.586	61.5	2 P	39.0	0 A	50.3	49.2	42.7	4.6
8	30.08	29.61	29.908	50.5	12 M	36.0	12 P	43.3	44.8	38.0	1.5
9	30.28	30.08	30.261	51.5	3 P	25.5	7 A	38.5	38.6	33.0	5.0
10	30.28	30.17	30.223	44.0	3 P	40.0	6 A	42.0	41.8	40.7	0.0
11	30.31	30.00	30.187	62.5	3 P	36.0	7:30 A	49.3	48.3	45.0	4.5
12	30.00	29.43	29 686	66.5	2 P	32.5	12 P	49.5	55.4	48 0	0.0
13	30.34	29.67	30.201	32.5	3 P	25.0	12 P	28.7	28.6	22.5	5.2
14	30.43	30.03	30.279	35.0	1:30 P	19 5	7 A	27.3	29.1	25.5	1.2
15	30.04	29.56	29.608	40.5	3:30 P	31.0	3 A	35 7	34.9	32.3	2.2
16	30.16	29.65	29.980	37.5	10 A	21.0	12 P	29.3	31.3	26.5	3.3
17	30.27	29.89	30.107	40.0	2 P	20.0	1 A	30 0	29.9	24.5	2.3
18	29 89	29 24	29.372	44.5	3 P	29 5	4 A	37.0	35.7	32.3	0.3
19	29.87	29 43	29.677	41.5	2:30 P	35 0	7:30 A	38 3	37.4	30.5	1.7
20	29.97	29.87	29.935	40.5	1 P	29 0	12 P	34.7	33 8	31.0	0.5
21	30.00	29.83	29.903	39.0	2 P	29.0	2 A	34.0	32.3	29.3	0.2
22	30.29	30.00	30.238	35.5	2:30 P	22 0	12 P	28 7	28.3	24.0	6.2
23	30.35	29.95	30.206	42.5	3 P	18 5	7 A	30.5	31.3	26.7	1.7
24	29.95	29.48	29.625	41.5	5 A	35.5	12 P	38.5	38.2	36.5	0.0
25	29.88	29.49	29.804	35.5	0 A	26.0	12 P	30.7	28 9	24.0	4.7
26	30.06	29.84	29.948	42.0	1 P	24 5	5 A	33.3	33.1	29.0	4.3
27	30.30	30.06	30.281	50.5	2:30 P	32.0	7:30 A	41.3	39.5	32.0	7.5
28	30.26	29.40	29.814	56.5	9 P	32.0	4:30 A	44.3	40.7	43 5	0.0
29	29.98	29.39	29.719	54.0	0 A	25.5	12 P	39.7	38.7	32.3	0.5
30	30.01	29.81	29.940	39.0	2 P	21.0	7 A	30.0	30 2	25.7	6.6

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	37.5	.298	77.0	N.N.E.	190	2.5	22	9 A	0 A	3 A	.27	
2	22.0	.165	73.0	N.W.	234	8.0	40	12 M				
3	25.5	.196	70.0	W.S.W.	177	1.5	17	2 P				
4	26.0	.195	72.5	S.S.W.	100	0.0	—	—				
5	23.5	.196	69.0	W.S.W.	60	0.0	—	—				
6	33.0	.212	90.5	N.E.	63	0.0	—	—	5 P	12 P	.44	
7	39.0	.312	78.0	W.	264	7.5	39	4 P	0 A	4 A	.23	
8	31.0	.276	64.0	W.N.W.	344	0.0	—	—				
9	38.5	.218	74.0	N.E.	89	0.0	—	—	11 P	12 P	.01	
10	39.5	.268	90.0	E.N.E.	71	0.0	—	—	0 A	3 P	.09	
11	43 5	.321	93.5	S.S.W.	170	2.0	20	5 P				
12	45.0	.385	82.0	S.S.W.	477	15.0	55	6 P	7 P	12 P	.41	
13	13.5	.141	58.5	W.N.W.	257	8.5	41	8 A				
14	21.5	.155	73.0	S.W.	117	0.0	—	—	9 P	12 P	.38	1.0
15	28.5	.198	81.5	W.N.W.	88	3.5	26	1 P	0 A	9 P	.40	T
16	18.5	.167	64.0	N.W.	336	6.5	36	5 P	7 A	8 A	T	T
17	13.0	.170	40.0	N.N.W.	105	0.0	—	—				
18	27.5	.199	79.5	S.W.	153	3.5	26	2 P	3 A	12 A	.88	T
19	18.5	.209	53.0	W.S.W.	471	7.0	38	2 P				
20	27.0	.186	82.5	S.S.W.	200	0.0	—	—	1 P	4 P	.05	T
21	23.5	.180	73.0	N.	122	2.5	22	11 P	6 A	9 P	T	T
22	19.0	.143	73.5	N W.	341	4.0	28	10 A				
23	20 0	.175	65.5	S.S.W.	149	1.5	17	4 A				
24	36.0	.222	93.5	N.E.	147	1.5	17	10 P	5 A	8 P	.63	
25	18.0	.144	70.5	N.W.	336	5.5	33	1 A				
26	21.5	.183	67.0	S.W.	155	0.0	—	—				
27	25 0	.212	64.5	S.	137	0.0	—	—				
28	42.0	.317	90.5	S.S.W.	83	3.0	24	10 P	5 P	12 P	.05	
29	24.5	.220	65.5	W.N.W.	364	4.5	30	2 P				
30	20.5	.154	74.5	W.	150	0.5	10	10 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during November while generally seasonal was marked by an exceptionally large amount of cloudiness and more than average precipitation. Rather high winds and marked barometric activity were also noticeable features.

The records of the several weather elements show the following features: The mean barometer was slightly lower than the normal and the range about an average value. The changes in pressure were rather rapid at times, especially the falling barometer preceding the low points reached the 12th, 18th and 29th; the difference between the maximum and minimum on the 28th being nearly .9 inches. Accompanying the marked barometric activity was a corresponding large wind movement. On nine days the wind movement averaged more than 10 miles per hour, and on two days nearly 20 miles per hour. Most of the wind was from the western points of the compass.

The mean temperature and range of temperature were both practically normal. The fall in temperature between 7 and 8 P. M. on the 12th was 21 degrees—an exceptionally sudden change for this locality. From 7 to 11 P. M. the change in temperature was 30 degrees.

The mean dew point and relative humidity were both considerably below the normals for these elements. The total precipitation was about 20 per cent more than the November average and was distributed throughout the month.

The amount of sunshine was exceptionally small, the number of hours recorded being the least ever noted at this station for a month.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 276. DECEMBER, 1911

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.25, 20th, 10 A.
Minimum reduced to freezing,	29.06, 27th, 5 P.
Reduced† maximum reading,	30.57, 20th, 10 A.
Reduced† minimum reading,	29.37, 27th, 5 P.
Mean semi-daily reduced,	30.153
Monthly range,	1.20

***Air Temperature.** In Degrees Fahr.

Highest,	62.0, 12th, 3:30 P.
Lowest,	10.0, 5th, 7 A.
Mean hourly,	32.7
Mean of means of max. and min.,	33.5
Mean sensible (wet bulb),	28.9
Monthly range,	52.0
Highest mean daily,	53.7, 12th
Lowest mean daily,	20.5, 5th
Mean maximum,	40.9
Mean minimum,	26.1
Mean daily range,	14.8
Greatest daily range,	33.0, 7th
Least daily range,	2.5, 15th

Humidity.

Mean dew point,	23.9
Mean force of vapor,	.185
Mean relative humidity,	77.3

Precipitation. In inches.

Total precipitation,	4.42
Number of days on which .01 inch or more rain fell,	9
Total snow in inches	4.5
Snow on ground at end of month,	3 in

Wind.

Total movement,	4857m
Greatest daily movement,	602m., 28th
Least daily movement,	18m., 8th
Mean daily movement,	157.0 m
Mean hourly velocity,	6.5 m

Maximum pressure per square foot, 30.5 lbs.= 79m. per hour, 28th, 10:30 A., W.N.W.

Maximum velocity for 5 minutes, 40m. per hour, 28th, 2P., N.W.

Prevailing Direction, Northwest.

Summary.

Northwest	19 per cent.
North	26 " "
West	10 " "
Other directions	45 " "

Weather.

Mean cloudiness observed,	63 per cent.
Total cloudiness recorded by the Sun Thermometer,	178 hrs.=63 per cent.
Number of clear days,	6
Number of fair days,	6
Number of cloudy days,	19

Bright Sunshine.

Number of hours recorded, 119 hrs.=37%

Rain, 9th, 15th, 16th, 17th, 2 d, 23d, 26th, 27th, 31st.

Snow, 15th, 18th, 31st.

Days Sleighing, 1.

Gales, 35 or more miles per hour: 35 m, 4th, N.: 43 m, 23d, W.N.W.: 79m, 28th, W.N.W.; 45 m, 29th, N.W.

Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.02	29.88	30.002	44.0	2:30 P	28.0	12 P	36.0	34.7	29.3	2.3
2	29.96	29.78	29.882	40.0	3 P	27.0	3 A	33.5	32.3	28.3	2.0
3	30.10	29 94	30.088	37.5	2:30 P	26 5	8 A	32.0	31 8	25.5	6.0
4	30.23	30.08	30.185	31.0	0 A	16.0	12 P	23.5	23.3	17.5	3.3
5	30.39	30.21	30.320	31.0	3:30 P	10.0	7 A	20.5	20.5	17.5	5.5
6	30 32	30.17	30.268	48.5	3 P	27.0	0 A	37.7	34.3	28.7	7.3
7	30.39	30.29	30.357	52.5	3 P	19.5	8:30 A	36.0	32.5	25.3	7.1
8	30.42	30.33	30.404	42.0	3 P	23.0	7 A	32.5	29.9	26.5	1.3
9	30.42	30.30	30.358	37.5	3:30 P	26.0	0:30 A	31.7	33.1	33.5	0.0
10	30.41	30.32	30.385	49.0	3:30 P	28.5	8:30 A	38.7	35.8	33 0	2.7
11	30.38	30.21	30.313	61.0	3 P	33 5	6 A	47.3	46.7	41.7	5.4
12	30.20	30.02	30.129	62.0	3:30 P	48.5	8:30 A	55 3	53.7	51.3	1.1
13	30.25	29.87	30.025	52.0	0 A	32.0	12 P	42 0	45.5	42.0	2.7
14	30.42	30.25	30.379	42 0	3 P	25.0	7:30 A	33.5	33.2	29 5	5.8
15	30.33	30.02	30.113	34 5	3 P	32.0	6 A	33.3	32.7	32.5	0.0
16	30.07	29.88	29.965	40.5	12 P	33.0	7:30 A	36.7	35.2	34.5	0 0
17	30.12	29.87	30.063	40.0	1 P	34 0	12 P	37.0	37.0	34.7	0.2
18	30.26	30.11	30.210	37.0	12:30 P	26.0	12 P	31.5	32.1	29 0	2.5
19	30.49	30.26	30.427	36.0	3 P	22 0	6 A	29 0	27 2	20.7	8.3
20	30.57	30.41	30.563	38.0	3:30 P	16 0	7:30 A	27.0	24.9	17.5	8.0
21	30.42	30 30	30.376	38.0	3 P	18.0	5 A	28 0	27.3	23.5	2.9
22	30.36	29.79	30.158	36.0	2:30 P	30.5	6 A	33.3	32.5	31.7	0.0
23	29 81	29.41	29.588	45.0	1:30 P	33 0	0 A	39.0	38.4	34.3	1.6
24	30.03	29.81	30.028	40.0	12 M	31.0	12 P	35.5	36.9	32.3	0.3
25	30.13	30.01	30.130	48.0	3 P	26 0	7:30 A	37.0	34.7	29.3	7.9
26	30.13	29.87	30.042	41.0	3:30 P	27.0	7:30 A	34 0	33.9	30.3	1.6
27	29.87	29.37	29.510	38.0	2:30 P	33 0	12 P	35.5	35.3	33.3	0.0
28	29.97	29.48	29.826	33.0	0 A	23 5	12 P	28.3	26 9	22 0	4.6
29	30.29	29.97	30.200	30.5	3 P	20.0	11 P	25.3	25 0	20.7	7.9
30	30.46	30.28	30.430	34.0	2:30 P	14.5	8 A	24.3	22.7	17.0	7.0
31	30.35	29.73	30.023	27.0	12 P	20.5	9 A	23.7	22.7	22.0	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	23.0	.185	69.0	W.	195	1.5	17	7 A				
2	23.0	.174	73.0	W.	76	1.5	17	6 P				
3	19.0	.160	67.0	W.S.W.	203	0.0	—	—				
4	4.5	.116	49.0	N.	327	6.0	35	9 A				
5	13.0	.107	78.5	N.	190	1.5	17	1 A				
6	23.5	.175	95.5	E.	126	0.0	—	—				
7	20.5	.159	77.0	W.	36	0.0	—	—				
8	24.0	.150	88.5	S.E.	18	0.0	—	—				
9	32.0	.297	93.0	S.E.	44	0.0	—	—	10 A	12 M	.02	
10	31.5	.196	93.0	S.W.	23	0.0	—	—				
11	39.0	.299	84.0	S.	162	1.0	14	1 P				
12	50 5	.388	95.0	S.	185	0.0	—	—				
13	38.0	.300	81.0	W.S.W.	263	3.0	24	3 P				
14	26.5	.173	86.5	N.	57	0.0	—	—				
15	30.5	.187	95.0	N.	63	0.0	—	—	3 A	2 P	.79	1.0
16	33.5	.204	65.5	N.	64	0.5	10	8 P	5 A	12 P	.98	
17	32.5	.223	86.5	N.W.	187	1.5	17	1 P	0 A	1 P	.21	
18	23 5	.179	71.5	N.W.	151	1 5	17	12 M	6 A	10 P		T
19	11.0	.131	56.5	N.	206	3.5	26	3 P				
20	2.0	.119	45.0	N.N.E.	92	0.0	--	—				
21	17.0	.144	69.0	N.	65	0.5	10	1 P				
22	30.5	.182	95.0	N.	46	0.0	—	—	1 A	12 P	.87	
23	29.5	.218	78.5	N W.	229	9 0	43	2 P	0 A	5 A	.58	
24	25 0	.172	66.5	N.W	230	2.0	20	1 A				
25	25.0	.178	77.5	S.W.	69	0.0	—	—				
26	26.0	.186	78.5	S.S.W.	54	0.0	—	—	11 P	12 P	.04	
27	29.0	.207	80.0	W.N.W.	75	4.5	30	10 P	0 A	6:30 P	.39	
28	13.0	.187	60.5	N.W.	602	30.5	79	10½ A				
29	13.0	.124	64.5	N.W.	566	10.0	45	1 A				
30	11.5	.105	73.0	N.N.W.	141	0.5	10	6 A				
31	20.0	.123	92.5	N.N.W.	112	0.0	—	—	5 A	10 P	.54	3.5

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1911.

Pressure. In inches.

Maximum reduced to freezing, ... 30.41, Apr. 13th, 9 A.
Minimum reduced to freezing, ... 28.64. Mar. 30th, 6 A.
Maximum reduced to freezing and sea-level, ... 30.72, Mar. 7th, 10 A.
Minimum reduced to freezing and sea-level, ... 28.95, Mar. 30th, 6 A.
Mean reduced to freezing and sea-level, ... 30.060
Annual range, ... 1.77

***Air Temperature.** In degrees Fahr.

Highest, ... 104.0, July 4th, 3:30 P.
Lowest, ... —3.0, Feb. 16th, 7:30 P.
Mean hourly, ... 47.6
Mean of means of max. and min., ... 48.0
Mean sensible (wet bulb), ... 42.7
Annual range, ... 107.0
Highest mean daily, ... 87.0, July 4
Lowest mean daily, ... 5.8, Feb. 6
Mean maximum, ... 58.6
Mean minimum, ... 37.3
Mean daily range, ... 21.3
Greatest daily range, 44.0, Feb. 16, Mar. 26, Apr. 29
Least daily range, ... 2.5, Dec. 15

Humidity.

Mean dew point, ... 38.3
Mean force of vapor, ...387
Mean relative humidity, ... 75.2

Wind.

Prevailing direction, ... West

Summary.

West, ... 13 per cent.
South, ... 12 " "
Northwest, ... 12 " "
North, ... 10 " "
Other directions, ... 53 " "
Total movement, ... 58.242 m
Greatest daily movement, ... 605 m., Mar. 16
Least daily movement, ... 14 m., Feb. 9
Mean daily movement, ... 160 m
Mean hourly velocity, ... 6.7 m

Maximum pressure per square foot, 30.5 lbs.=79 m. per hour, Dec. 28th, 10:30 A., N.N.W.
Maximum velocity for 5 minutes, 50 m. per hour, Jan. 30th, 5 P., W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 44.21
Number of days on which .01 or more rain or melted snow fell, ... 120
Snow total in inches, ... 35.0

Weather.

Mean cloudiness observed, ... 55 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2023 hrs.=45 per cent.
Number of clear days, ... 106
Number of fair days, ... 131
Number of cloudy days, ... 128

Bright Sunshine.

Number of hours recorded, 2431 hrs.=55 per cent

Dates of Frosts.

Last, ... May 5th
First, ... Sept. 14th

Dates of Snow.

Last, ... April 19th
First, ... Nov. 14th
Total days of sleighing, ... 23

Gal s of 50 or More Miles Per Hour.

Jan. 30th, 62m., N.; March 16th, 65m., N.N.W.; Nov. 12th. 55 m., S.W.; Dec. 28th, 79 m., W.N.W.

*Temperature in ground shelter.

R. N. HALLOWELL,
Observer.

J. E. OSTRANDER,
Meteorologist.

BULLETIN No. 277. JANUARY, 1912

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 25, 14th, 5 A.
Minimum reduced to freezing,	28.67, 9th, 7 A.
Reduced† maximum reading,	30.59, 14th, 5 A.
Reduced† minimum reading,	28.99, 9th, 7 A.
Mean semi-daily reduced,	30.023
Monthly range,	1.60

***Air Temperature.** In Degrees Fahr.

Highest,	45.0, 19th, 11 A.
Lowest,	—19.0, 14th, 8:30 A.
Mean hourly,	14.6
Mean of means of max. and min.,	14.7
Mean sensible (wet bulb),	11.9
Monthly range,	64.0
Highest mean daily,	33.0, 18th
Lowest mean daily,	—3.7, 13th
Mean maximum,	23.9
Mean minimum,	5.6
Mean daily range,	18.3
Greatest daily range,	30.5, 14th
Least daily range,	6.5, 12th

Humidity.

Mean dew point,	7.8
Mean force of vapor,	.092
Mean relative humidity,	81.3

Precipitation. In inches.

Total precipitation,	2.18
Number of days on which .01 inch or more rain fell,	11
Total snow in inches	13.3
Snow on ground at end of month,	5 in.

Wind.

Total movement,	4872m.
Greatest daily movement,	432m., 6th
Least daily movement,	10m., 26th
Mean daily movement,	157.2 m
Mean hourly velocity,	6.5 m

Maximum pressure per square foot, 19.5 lbs.= 62m. per hour, 9th, 1 P., W.

Maximum velocity for 5 minutes, 36m. per hour, 9th, 3 P., W.

Prevailing Direction, Northwest.

Summary.

North	26 per cent.
West Northwest	10 " "
Northwest	16 " "
South Southwest	13 " "
South	10 " "
North Northeast	10 " "
Other directions	15 " "

Weather.

Mean cloudiness observed,	55 per cent.
Total cloudiness recorded by the Sun Thermometer,	145 hrs.=49 per cent.
Number of clear days,	5
Number of fair days,	16
Number of cloudy days,	10

Bright Sunshine.

Number of hours recorded, 149 hrs.=51%

Rain, 9th, 19th, 23d.

Snow, 5th, 7th, 8th, 9th, 12th, 15th, 16th, 17th, 22d, 27th, 29th, 30th, 31st.

Days Sleighing, 31.

Gales, 35 or more miles per hour: 39 m, 5th, N.N.W.; 35 m. 6th, N.W.; 62 m, 9th, W.; 35 m, 10th, W.; 39m, 19th, W.N.W.

* Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.18	29.73	29.991	33.5	1 P	21.5	12 P	27.5	28.5	25.7	3.2
2	30.28	30.14	30.224	35.0	3 P	8.5	9 A	21.7	22.3	19.3	6.9
3	30.14	30.03	30.109	35.0	3 P	15.0	8:30 A	25.0	25.3	18.7	6.9
4	30.03	29.71	29.926	32.0	2:30 P	16.0	12 P	24.0	21.8	17.0	6.4
5	29 80	29.53	29.625	18.0	7 A	7.0	12 P	12.5	14.0	13.3	1.8
6	30.33	29.80	30.245	7.0	0 A	−3.0	12 P	2.0	1.9	−0.7	7.0
7	30 34	30.08	30.277	12.5	3 P	−10.5	7:30 A	1.0	−1 8	−4.7	6.8
8	30.48	29.52	30.258	17.0	12 P	−7.0	5:30 A	5.0	5.2	4.0	1.9
9	29.79	28.99	29.348	30.0	8 A	9.0	12 P	19.5	19.3	20.3	5.7
10	30.08	29.79	30.009	15.0	3 P	2.0	7:30 A	8.5	8 8	4.3	7.8
11	30.34	30.08	30.273	17.5	3 P	1.0	7 A	9.3	7.2	2.5	7 9
12	30.42	30.22	30.359	5.0	1:30 A	−1.5	11 P	1.7	2.9	2.3	2.0
13	30.58	30.29	30.534	9.5	3 P	−14.0	8 A	−2.3	−3.7	−8.7	8.3
14	30.59	30.18	30.419	11.5	12 P	−19.0	8:30 A	−3.7	−2.9	−5.5	5.2
15	30.18	29.44	29.621	32.0	5:30 P	11.5	0 A	21.7	22.0	21.3	2.3
16	29.96	29.45	29.652	18.0	0 A	8.0	12 P	13.0	11.5	9.3	5.4
17	30.29	29.96	30.228	22.0	3:30 P	−3 0	7:30 A	9.5	12.3	8.3	4.9
18	30.23	29.96	30.123	36.0	12 P	21.0	0 A	28.5	29 0	27.7	0 6
19	30.08	29.61	29.798	45.0	11 A	16.5	12 P	30.7	33.0	29 5	0.2
20	30.36	30.08	30.314	23.5	3 P	11.0	8 A	17.3	16.0	12.0	8.4
21	30.29	30.07	30.155	31.5	4 P	9 0	9:30 A	20.3	18.6	15 7	6.3
22	30.19	29.97	30.120	34.0	4 P	11.5	5 A	22.7	22.7	20.7	4.8
23	29.97	29.67	29.764	37.5	3 P	25.0	6 A	31.3	31.4	29.7	0.0
24	29.89	29.72	29.807	30.5	1 A	13.5	12 P	22.0	23 1	19.3	7.4
25	30.02	29.89	29.995	18.0	1 P	−2.5	8:30 A	7.7	7.4	2.3	8.5
26	30.05	29 90	29.979	14.0	3 P	−12.0	8:30 A	1.0	0.7	−2.1	5.7
27	30.11	29.78	29.897	21.5	3 P	3.5	5 A	12.5	8.3	6.5	5.3
28	30.30	30.11	30.259	22.0	3 P	−8.0	7:30 A	7.0	7.9	1.6	6.7
29	30.27	29 84	30.059	18.5	12 P	8.5	9:30 A	13.5	13.1	13.0	0.0
30	29.85	29 73	29.796	27.5	4 P	18.5	0 A	23.0	22.7	23 0	1.7
31	29.73	29.48	29.552	31.0	3 P	16.0	11 P	23.5	24.2	22.5	3.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	19.0	.158	67.0	W.N.W.	155	2.5	22	4 P				
2	16.0	.121	85.0	W.	90	0.0	—	—				
3	15.5	.111	82.5	N.N.E.	108	0.0	—	—				
4	8.5	.106	67.5	N.	143	0.0	—	—				
5	9.5	.087	82.5	N.N.W.	241	7.5	39	11 P	3 A	7 A	.04	1.0
6	−5.0	.045	80.0	N.W.	432	6.0	35	1 P				
7	−7.5	.037	83.0	N.	36	0.0	—	—	9 A	10 A	T	T
8	0.5	.058	84.5	E.N.E.	45	0.0	—	—	4 P	12 P	.60	3.0
9	17.0	.124	83 0	W.N.W.	377	19 5	62	1 P	0 A	7 A	.02	T
10	−7.0	.061	55.5	W.	393	6.0	35	3 P				
11	9.0	.055	54.5	N.W.	171	0.5	10	1 A				
12	−4.5	.053	71.5	N.N.E.	173	2.0	20	8 P	7 A	7 P	.02	0.3
13	−11.0	.031	88.0	N.	159	2.0	20	2 A				
14	−9.0	.042	83.0	N.	33	0.0	—	—				
15	19.0	.123	85.0	N.W.	156	1.0	14	11 A	1 A	12 M	.49	3.0
16	6.0	.071	86.0	N W.	226	0.0	—	—	8 A	11 A	T	T
17	5.5	.073	84.5	S.S.W.	148	0.0	—	—	6 P	12 P	.28	.0
18	24.0	.165	81.0	S.S.W.	203	2.0	20	8 P				
19	25.5	.183	81.5	S.S.W.	350	7.5	39	1 P	3 A	12 M	.21	
20	7.5	.082	78.0	S.S.W.	181	2.5	22	5 A				
21	13.0	.096	87.0	S.	73	0.0	—	—				
22	19.0	.124	94.0	S.	47	0.0	—	—	7 P	11 P	.05	0 5
23	27.5	.174	88.0	S.	51	1.0	14	10 P	1 P	5 P	.01	
24	15.0	.116	78.5	W.N.W.	301	5.0	32	12 M				
25	1.0	.053	92.5	N.W	112	1.0	14	2 P				
26	−4.0	.045	91.0	N.	10	0.0	—	—				
27	2.0	.064	78.0	N.N.W.	142	1.5	17	3 P	8 A	12 M	T	T
28	−4.5	.056	74.5	N.	33	0.0	—	—				
29	10.5	.084	91.0	N.	85	0.0	—	—	6 A	7 P	.4	.0
30	21.5	.127	93.5	N.	145	1.5	17	1 A	12 M	2 P	T	T
31	20.5	.126	90.0	N.N.E.	53	0.0	—	—	6 A	2 P	.02	0.5

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The temperature prevailing during the month was in marked contrast with that of the previous month. While December averaged about 6 degrees warmer than the normal for that month, January was nearly 9 degrees colder than usual. The mean daily temperature gives a record almost as low as that of January, 1904,—the coldest month since this station was established. The ground has been covered with snow throughout the month and the sleighing, begun on the last day of last year, has continued without a break throughout the month.

The records of the various weather elements show the following features of interest: The mean barometer was nearly normal and the range slightly larger than usual. The minimum reduced reading was just under 29 inches and marked the culmination of the heaviest precipitation of the month. The maximum pressure was considerably below the normal for this station.

The mean temperature, as noted above, was nearly 9 degrees below the normal, and was only three-tenths of a degree higher than the record of January, 1904. The maximum was about 5 degrees lower than the average value and the minimum more than 10 degrees lower than the normal for January. Our records showing a lower temperature for January are, 1899, —21.5 degrees; 1904, —26.0 degrees; 1907, —23.5 degrees. On the 7th, 13th and 14th the mean hourly temperature was below zero—a very unusual record.

The mean dew point was about 10 degrees lower than usual while the relative humidity was several points above the normal.

The total precipitation was about 60 per cent of the normal and nearly all of it occurred as snow. The snowfall of a little more than a foot, occurred in several small storms and was well distributed throughout the month.

The total wind movement was practically normal and more than usual was from the northwest quadrant. About an average amount of sunshine was noted.

J. E. OSTRANDER, Meteorologist

R. N. HALLOWELL, Observer.

BULLETIN No. 278. FEBRUARY, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.13, 14th, 7 A.
Minimum reduced to freezing,	28.41, 22d, 6 A.
Reduced† maximum reading,	30.47, 14th, 7 A.
Reduced† minimum reading,	28.72, 22d, 6 A.
Mean semi-daily reduced,	29.931
Monthly range,	1.75

***Air Temperature.** In Degrees Fahr.

Highest,	49.5, 24th, 4 P.: 25th, 2 P.
Lowest,	—16.5, 11th, 6 A.
Mean hourly,	20.7
Mean of means of max. and min.,	21.4
Mean sensible (wet bulb),	17.1
Monthly range,	66.0
Highest mean daily,	39.9, 25th
Lowest mean daily,	—3.8, 10th
Mean maximum,	32.0
Mean minimum,	10.9
Mean daily range,	21.1
Greatest daily range,	38.0, 15th
Least daily range,	9.0, 26th

Humidity.

Mean dew point,	12.6
Mean force of vapor,	.116
Mean relative humidity,	78.4

Precipitation. In inches.

Total precipitation,	3.16
Number of days on which .01 inch or more rain fell,	5
Total snow in inches	2.5

Wind.

Total movement,	4798m.
Greatest daily movement,	578m., 22d
Least daily movement,	3m., 17th
Mean daily movement,	165.4 m
Mean hourly velocity,	6.9 m

Maximum pressure per square foot, 23.0 lbs.= 68m. per hour, 22d, 9 A., W. S. W.

Maximum velocity for 5 minutes, 52 m. per hour, 22d, 10 A., W. S. W.

Prevailing Direction, Northwest.

Summary.

North	31 per cent.
West Northwest	14 " "
Northwest	24 " "
South Southwest	" "
South	" "
North Northeast	" "
Other directions	31 " "

Weather.

Mean cloudiness observed,	36 per cent.
Total cloudiness recorded by the Sun Thermometer,	128 hrs.=42 per cent.
Number of clear days,	11
Number of fair days,	9
Number of cloudy days,	9

Bright Sunshine.

Number of hours recorded, 180 hrs.=58%

Rain, 20th, 21st, 26th.

Snow, 6th, 8th, 21st, 22d, 26th.

Hail, 21st.

Thunder and Lightning, 22d.

Days Sleighing, 23.

Gales, 35 or more miles per hour: 36 m, 4th, N.W.; 68 m, 22d, W. S. W.; 38 m, 23d, W. N. W. 38 m, 27th, N. W.; 38m, 29th, N.W.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean, Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.71	29.56	29.679	26.5	4:30 P	13.0	3 A	19.7	20.5	18.7	8.6
2	29.71	29.59	29.647	35.5	3 P	7.5	8:30 A	21.5	21.7	18.7	6.5
3	29.93	29.68	29.856	21.5	2 P	6.5	12 P	14.0	17.2	13.0	8.0
4	29.92	29.68	29.762	15.5	1 P	1.5	7:30 A	8.5	9 6	5.7	3 2
5	29 92	29.75	29.866	24.0	3 P	10.0	8:30 A	17.0	14 8	11.5	8.5
6	30.02	29.92	29.973	30.0	5 P	13.5	9:30 A	21.7	18.6	17.5	3.7
7	30.05	29.86	29.967	35.0	3 P	−0.5	7:30 A	17.3	18 4	14.0	7.2
8	29.91	29.74	29.841	28.5	3 P	9.5	12 P	19.0	20.4	13.7	5.0
9	29.94	29.77	29.862	19.0	3 P	1.5	7 A	10.3	9.3	5.3	7.5
10	30.11	29.84	30.074	6 0	0 A	−8.0	12 P	−1.0	−3 8	−7.3	9.0
11	30.07	29.93	30.008	20.0	4 P	−16.5	6 A	1.7	2.4	−2.5	8 6
12	30.24	30.02	30.159	26.5	3 P	−0.5	7 A	13.0	11.3	8.0	8.8
13	30.46	30.24	30 406	31.0	3:30 P	−2.0	7:30 A	14 5	11.5	6.3	9.3
14	30.47	30.25	30.356	30.0	4 P	−5.0	7 A	12.5	10.2	7.9	7.8
15	30.30	30.05	30.204	37.5	4:30 P	−0.5	8 A	18.5	19.4	13.9	8 6
16	30 05	29 75	29.822	39.5	3 P	18.0	12 P	28.7	28.6	26 0	6 3
17	29.97	29.83	29.912	33.5	4 P	10.0	7 A	21.7	19.7	17.5	1.9
18	30.00	29 91	29.964	41.0	3 P	8 5	7:30 A	24 7	25.3	19 7	7 2
19	30.03	29.94	30.016	41.5	1:30 P	27.0	7 A	34.3	34.6	31.0	2.1
20	30.03	29.92	29.971	44.0	3:30 P	27.5	12 P	35.7	35 1	32.5	7.0
21	30.07	29.21	29.810	33.0	12 P	21 0	4 A	27 0	26 7	25.3	0.2
22	29.82	28.72	29.257	47.0	4 A	20.5	12 P	33.7	27.4	23.3	0.7
23	30.22	29 82	30.112	34.0	5 P	17 0	6 A	25.5	24.0	20.7	8.7
24	30.25	30.06	30.153	49.5	4 P	23 0	1 A	36.3	36 6	34.3	7.1
25	30.05	29.98	30.028	49.5	2 P	33 5	7 A	41.5	39.9	34 5	3 9
26	30.09	29.39	29.857	36 0	0 A	27.0	9 A	31.5	29.9	27.0	0.6
27	29 63	29.20	29.416	35.5	10:30 A	22.5	12 P	29 0	27.5	24.0	4.5
28	29.96	29 63	29.858	30 0	3 P	19.0	5:30 A	24.5	24.0	21.0	9.8
29	30.24	29.96	30 177	27.0	3 P	12.0	12 P	19.5	18.9	15.7	9.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	15.5	.110	82.0	W.N.W.	190	3.0	24	11 A				
2	16.5	.118	87.5	S.S.W.	39	0.0	—	—				
3	6.0	.086	78.5	N.W.	165	2.5	22	2 P				
4	0.0	.062	73.5	N.W.	186	6.5	36	3 P				
5	5.5	.081	72.5	N.N.W.	366	3.5	26	10 A				
6	14 5	.103	85.0	N.	124	0.0	—	—	8 A	12 M	T	T
7	12.0	.100	86.5	N.W.	30	0.0	—	—				
8	5.5	.092	64.0	N W.	151	2.0	20	3 P	1 A	5 A	.09	.50
9	−3.5	.062	61.5	W.	193	4 0	28	11 P				
10	−10.5	.032	84.5	N.W	327	4.0	28	3 A				
11	9.5	.047	69 5	N.	99	1.0	14	12 M				
12	1.5	.068	70.5	N.	114	4.0	28	10 A				
13	1.5	.065	76 5	N.	50	0.0	—	—				
14	5.0	.076	85.0	N.	46	0.0	—	—				
15	12 5	.103	94 5	N.	51	0.5	10	8 P				
16	22 5	.149	83.0	N.N.E.	181	1.5	17	12 M				
17	15 0	.106	87 5	N.	3	0.0	—	—				
18	17 5	.129	86.0	N.N.W.	21	0.0	—	—				
19	28.5	.185	85 5	N.	83	0.0	—	—				
20	28.0	.200	79.0	S.S.W.	183	1 5	17	6 P	5 A	8 A	.03	
21	23.5	.138	94.0	W.N.W.	125	0 0	—	—	2 P	12 P	.75	1.0
22	18.0	.139	73.0	W.S.W.	578	23.0	68	9 A	0 A	4 P	1.19	T
23	14.5	.125	70.5	W.N.W.	454	7 0	38	10 A				
24	30 0	.220	76.5	S.	83	0 0	—	—				
25	29.0	.228	72.0	E.	80	0 5	10	5 P				
26	22.5	.160	78 0	N.	110	1.0	14	5 A	1 P	12 P	1.10	1.0
27	18.5	.144	74.0	N.W.	233	7.0	38	5 P				
28	14.5	.126	71.0	W.N.W.	255	3.0	24	4 P				
29	9.5	.099	71.5	N.W.	278	7.0	38	4 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during February was considerably colder than usual, although it was much less severe than that of the preceding month. With but a very light fall of snow, the low temperature preserved the sleighing during the greater part of the month. Only two storms of any amount occurred and both were mostly rain. Low barometer and very high winds were especially marked during the first of these two storms.

The records of the several weather elements show these features of interest: The mean barometer was fully a tenth of an inch lower than the normal and the maximum pressure was two-tenths less than the average of the February maximums. The minimum barometer, which was noted during the heavy storm of the 21st-22d, was one of the lowest records at this station in recent years. The pressure recovered more than an inch in the 18 hours following the time of lowest reading. The total wind movement on the two days, 22d-23d, was over a thousand miles. Much more than the usual amount of wind was from the northwest quadrant.

The mean temperature was more than two degrees below the normal and the maximum for the month was nearly 8 degrees lower than the average value for this feature. On account of this low record the range was exceptionally large. The mean hourly temperature on the 10th shows that date was the coldest so far this year.

The mean dew point was over four degrees below the normal, while the relative humidity was about the usual value.

The total precipitation was practically normal and nearly all of it occurred as rain. Moderate thunder and lightning accompanied the storm of the 21st-22d. The percentage of cloudiness was comparatively small.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 279. MARCH, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 37, 6th, 1 A
Minimum reduced to freezing,	28.96, 29th, 2 P.
Reduced† maximum reading,	30.70, 6th, 1 A.
Reduced† minimum reading,	29.27, 29th, 2 P.
Mean semi-daily reduced,	30.125
Monthly range,	1.43

***Air Temperature.** In Degrees Fahr.

Highest,	60.5, 31st, 2 P.
Lowest,	1.0, 6th, 7 A.
Mean hourly,	30.5
Mean of means of max. and min.,	30.9
Mean sensible (wet bulb),	27.6
Monthly range,	59.5
Highest mean daily,	44.0, 18th
Lowest mean daily,	15.8, 3d, 4th
Mean maximum,	40.5
Mean minimum,	21.3
Mean daily range,	19.2
Greatest daily range,	35.0, 31st
Least daily range,	5.0, 12th

Humidity.

Mean dew point,	23.4
Mean force of vapor,	.173
Mean relative humidity,	80.3

Precipitation. In inches.

Total precipitation,	5.70
Number of days on which .01 inch or more rain fell,	8
Total snow in inches	12

Wind.

Total movement,	5291m.
Greatest daily movement,	412m., 10th
Least daily movement,	19m., 28th
Mean daily movement,	170.0 m
Mean hourly velocity,	7.1 m

Maximum pressure per square foot, 6.0 lbs.= 35m. per hour, 25th, 4 A., N.

Maximum velocity for 5 minutes, 22 m. per hour, 25th, 11 A., N. N. E.

Prevailing Direction, Northwest.

Summary.

Northwest	19 per cent.
North	19 " "
South Southwest	13 " "
West	13 " "
North Northeast	10 " "
North Northwest	10 " "
Other directions	26 " "

Weather.

Mean cloudiness observed,	53 per cent.
Total cloudiness recorded by the Sun Thermometer,	147 hrs.=40 per cent.
Number of clear days,	13
Number of fair days,	10
Number of cloudy days,	8

Bright Sunshine.

Number of hours recorded, 224 hrs.=60%

Rain, 8th, 12th, 13th, 21st, 24th, 28th, 29th, 31st.

Snow, 5th, 6th, 8th, 9th, 12th, 13th, 21st, 24th, 26th.

Days Sleighing, 3.

Gales, 35 or more miles per hour: 35m, 25th, N.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.29	30.19	30.258	27.5	4 P	10.0	6:30 A	18.7	18.2	15.0	8.3
2	30.46	30 29	30.377	24.0	4 P	9.5	7 A	16.7	16.2	13.3	9.5
3	30.60	30.46	30.565	28.0	4 P	8 0	7 A	18.0	15 8	12.5	9.8
4	30.65	30.44	30.551	27.0	5 P	6.0	7 A	16.5	15.8	12.7	8.7
5	30.67	30.42	30.576	26.5	5 P	13.0	7 A	19.7	17.7	14.5	10 0
6	30.70	30 42	30.569	34.0	3:30 P	1.0	7 A	17.5	18.0	15.7	8.5
7	30.42	30.13	30:209	41.5	3:30 P	26.0	6 A	33.7	33 2	31 0	6.1
8	30.17	29.94	30.051	43.5	3 P	32.0	6:30 A	37.7	35.8	34.5	4.4
9	29.94	29.79	29.850	40.0	2 P	28.0	12 P	34.0	34.9	32.7	0.0
10	29.97	29.82	29.901	34.0	11:30 A	20 5	12 P	27.3	27.3	23.0	10.4
11	30.21	29.97	30.187	40.5	5 P	17 0	7 A	28.7	27.8	25.7	10.8
12	30.19	29 83	30.050	34.0	12 P	29.0	0 A	31.5	31.3	30 7	0.0
13	29.84	29.45	29.593	40.5	2:30 P	33.5	0 A	37.0	36.2	34.7	0.0
14	30.20	29.84	30.163	45.0	1:30 P	27.0	6:30 A	36.0	35.6	31.3	9.2
15	30.19	29.31	29.692	48.0	12 P	32.0	3 P	40.0	34.5	33.0	0 0
16	30.53	29.53	30 241	45.0	3:30 P	28.0	12 P	36.5	38.6	32.3	7.2
17	30.62	30 34	30.524	52.0	3 P	24.0	6:30 A	38 0	36.5	31.3	10.5
18	30 34	29 96	30.122	57.0	4:30 P	35 0	12 P	46 0	44.0	39.5	9 0
19	30.19	29.88	30.064	57.0	3 P	27.5	6:30 A	42.3	42.0	39.0	10 3
20	30.29	29 85	30.072	50.0	10:30 A	22 0	12 P	36 0	38.8	35.3	10.1
21	30.29	30.02	30.123	22.0	0 A	15.5	8 A	18.7	17.5	15.3	1.2
22	30.43	30.04	30.239	31.5	5 P	16.0	6:30 A	23.7	22.4	20.7	8.5
23	30.52	30.21	30.413	39.5	1:30 P	11.0	6 A	25.3	26.9	25.7	11.0
24	30.21	29.59	29 720	33.0	4 P	26 0	3 A	29 5	29 3	27.7	1.5
25	30.12	29.58	29.852	35.0	0:30 P	14.5	12 P	24.7	28.2	25 0	9.3
26	30 24	29.96	30.126	34.5	3 P	2.0	6 A	18 3	22.4	21.7	9 0
27	30.07	29.94	30.036	48.0	4 P	28.0	6:30 A	38.0	37 1	35 0	9.7
28	30.05	29.94	30.015	57.0	1:30 P	28.5	7 A	42.7	41.9	36.7	8.8
29	29.94	29.27	29.586	45 5	5 P	36.0	8 A	40.7	38.7	37.3	0.0
30	30.23	29.71	30.156	53.5	4 P	29.5	12 P	41.5	39.2	34 0	11.8
31	30.21	29.83	30.006	60.5	2 P	25.5	6 A	43.0	43.7	37 3	10.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	6.0	.099	61.5	N.W.	125	1.5	17	4 P				
2	7.5	.088	71.0	N W.	278	5 0	32	1 P				
3	5.5	.086	68.0	N.	196	0.0	—	—				
4	6.0	.092	69.0	N.N.W.	155	1.0	14	8 A				
5	7.5	.095	68.5	N.	273	4 0	28	8 A	3 A	5 A	T	T
6	14.0	.094	92.5	N.	30	0.0	—	—	6 P	9 P	T	T
7	28.5	.181	92.0	N.	163	0.5	10	8 A				
8	32.5	.206	90.5	W.	95	0.0	—	—	7 P	11 P	.15	0.5
9	29.5	.197	83.5	E.	122	3 0	24	11½ P	9 A	2 P	T	T
10	17.5	.137	73 0	N.W	412	3.0	24	2 P				
11	21.0	.153	77.5	N.	141	0 5	10	8 A				
12	28.5	.176	92.5	S.S.W.	156	0.0	—	—	6 A	12 P	1.32	T
13	34.0	.205	95.5	N.W.	190	1.5	17	11 P	0 A	7 P	.43	T
14	27.0	.193	77.5	W.	168	2.0	20	3 A				
15	31.0	.192	93.0	W.	68	0.0	—	—	2 A	8 P	1.10	
16	27.5	.200	76.5	N.W.	256	4.0	28	8 A				
17	27.0	.197	78.0	S.S.W.	143	2.0	20	4 P				
18	35.0	.276	73.5	W.	217	1.5	17	5 P				
19	36.5	.261	85.0	S.S.W.	188	2.5	22	3 P				
20	33.5	.224	90.5	N.W.	265	4.5	30	4 P				
21	11.0	.094	83.0	N.N.W.	192	0.0	—	—	4 A	11 P	.55	3.5
22	14.0	.126	67.5	W.N.W.	196	3.5	27	1 P				
23	22.0	.150	82.0	S.W.	100	0.0	—	—				
24	25.5	.156	91.5	N.E.	166	1.0	14	11 A	1 A	6 P	1.20	8.0
25	20.0	.147	75 5	N.N.E.	283	6 0	35	4 A				
26	18.5	.132	88.0	S.S.W.	171	3.0	24	5 P	4 P	7 P	T	T
27	30.5	.225	78.0	N.N.W.	153	0 5	10	10 A				
28	33.0	.244	79.5	S.	19	0.0	--	—	7 P	12 P	.02	
29	36.0	.228	94.0	N.N.E.	40	2.0	20	9 P	0 A	3 P	.93	
30	28.5	.220	71 5	N.	198	0.0	—	—				
31	32.0	.294	70.0	N.N.E.	112	1.5	17	3 P	9 P	10 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during March, while wintry and colder than the normal, was considerably less severe than that of the preceding two months. Several well defined storms occurred and the heaviest snowstorm of the winter was noted near the end of the month. The transition from winter to spring however was fairly complete at the close of the month. The most important departures from the normals were in the records for mean barometer and total precipitation.

A comparison of the records of the several weather elements with the normals for this station shows the following features of more or less interest. The mean barometer was unusually high and the range greater than usual. A number of rather large waves of pressure were recorded on the barometer chart. The large amount of wind from the northwest quadrant was unusual.

The mean temperature was over three degrees below the normal and the maximum and minimum records for the month were both well below the usual values. The range was practically normal. The mean dew point was three degrees below the normal and the relative humidity was about six points higher than the average March value.

The total precipitation was fifty per cent more than usual and most of it occurred during a few rather heavy storms.

The total wind movement was rather small for the time of year and only one gale was registered. The amount of sunshine was considerably in excess of the average amount.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 280. APRIL, 1912

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 31.26th, 6 A.
Minimum reduced to freezing,	28.99, 2d, 10:30P.
Reduced† maximum reading,	30.62, 26th, 6 A.
Reduced† minimum reading,	29.30, 2d, 10:30P.
Mean semi-daily reduced,	29.995
Monthly range,	1.32

***Air Temperature.** In Degrees Fahr.

Highest,	78.0, 6th, 4 P.
Lowest,	24.0, 4th, 7 A.
Mean hourly,	45.2
Mean of means of max. and min.,	46.2
Mean sensible (wet bulb),	41.4
Monthly range,	54.0
Highest mean daily,	61.8, 6th
Lowest mean daily,	29.8, 9th
Mean maximum,	56.8
Mean minimum,	35.7
Mean daily range,	21.1
Greatest daily range,	42.0, 5th
Least daily range,	5.5, 14th

Humidity.

Mean dew point,	37.0
Mean force of vapor,	.308
Mean relative humidity,	77.2

Precipitation. In inches.

Total precipitation,	3.92
Number of days on which .01 inch or more rain fell,	17
Total snow in inches	1

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

Wind.

Total movement,	6094m.
Greatest daily movement,	419m., 8th
Least daily movement,	52m., 15th
Mean daily movement,	203 m
Mean hourly velocity,	8.5 m

Maximum pressure per square foot, 10.0 lbs.= 45m. per hour, 23d, 12 M., N.W.

Maximum velocity for 5 minutes, 33 m. per hour, 23d, 10 A., W. N. W.

Prevailing Direction, West.

Summary.

South Southwest	23 per cent.
Northwest	13 " "
North	13 " "
West Northwest	13 " "
Southwest	10 " "
Other directions	28 " "

Weather.

Mean cloudiness observed,	64 per cent.
Total cloudiness recorded by the Sun Thermometer,	204 hrs.=51 per cent.
Number of clear days,	5
Number of fair days,	14
Number of cloudy days,	11

Bright Sunshine.

Number of hours recorded, 198 hrs.=49%

Rain, 1st, 2d, 3d, 5th, 7th, 8th, 9th, 12th, 14th, 15th, 16th, 17th, 18th, 19th, 22d, 24th, 27th. 29th.

Snow, 3d, 8th, 9th.

Late Frosts, 21st, 26th.

Thunder and Lightning, 15th, 16th.

Hail, 5th, 19th.

Gales, 35 or more miles per hour: 43m, 7th, S.W.; 39m, 8th, W.N.W.; 45m, 23d, N.W. 35m, 24th, W.S.W.; 37m, 27th, W.N.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	29.86	30.067	51.0	3:30 P	33.5	5:30 A	42.3	41.4	37.7	7.5
2	29.93	29.30	29.485	39.0	1 P	32.0	12 P	35.5	34.9	34.0	0.0
3	30.10	29.34	29.813	39.5	1 P	25.0	12 P	32.3	32.3	29.0	10.5
4	30.34	30.10	30.303	44.0	5 P	24.0	7 A	34.0	32.0	29.0	11.6
5	30.34	29.93	30.075	70.0	3:30 P	28.0	1 A	49.0	50.3	46.5	9.5
6	29.99	29.92	29.972	78.0	4 P	48.0	6 A	63.0	61.8	57.3	10.0
7	29.96	29.56	29.796	70.0	2 P	34.5	12 P	52.3	52.5	44.5	7.3
8	30.09	29.83	30.028	34.5	2 P	27.0	12 P	30.7	30.1	27.7	5.8
9	30.09	29.70	29.905	35.0	10 A	25.5	5:30 A	30.3	29.8	28.5	2.6
10	29.96	29.70	29.879	49.5	4 P	31.5	0 A	40.5	38.1	32.0	8.7
11	29.99	29.88	29.948	50.0	1 P	29.5	3:30 A	39.7	39.3	38.7	7.5
12	30.06	29.95	30.036	54.0	1 P	29.0	5 A	41.5	40.7	38.3	6.7
13	30.27	30.04	30.179	64.0	4:30 P	38.5	5 A	51.3	48.8	43.5	9.7
14	30.37	30.27	30.348	46.0	0 A	40.5	8:30 A	43.3	42.5	40.3	0.0
15	30.35	30.04	30.169	69.0	5 P	39.0	6 A	54.0	50.5	50.0	4.5
16	30.07	29.78	29.900	76.5	3 P	55.0	5 A	65.7	61.1	58.7	4.7
17	29.95	29.88	29.922	64.5	1 P	49.0	6:30 A	56.7	56.1	49.7	7.7
18	29.92	29.71	29.800	50.0	0 A	37.0	12 P	43.5	44.0	41.3	0.0
19	29.89	29.64	29.723	51.0	1:30 P	36.0	6 A	43.5	40.7	38.5	2.2
20	30.13	29.89	30.097	62.5	4:30 P	36.0	6 A	49.3	47.3	40.7	12.8
21	30.16	30.02	30.096	71.5	3:30 P	31.5	6 A	51.5	51.1	40.5	11.6
22	30.04	29.42	29.724	58.5	5 P	45.5	6 A	52.0	50.7	49.3	0.0
23	29.90	29.36	29.617	54.5	3 A	40.0	3 P	47.3	45.8	41.7	2.6
24	30.08	29.90	30.029	57.5	3:30 P	36.5	6 A	47.0	47.0	44.5	7.9
25	30.55	30.08	30.360	64.0	3 P	38.5	12 P	51.3	50.1	45.7	10.9
26	30.62	30.30	30.500	65.0	1 P	31.0	5:30 A	48.0	49.7	43.5	10.2
27	30.30	29.85	30.000	65.5	6 P	42.0	12 P	53.7	55.0	50.5	5.3
28	30.13	30.01	30.105	57.5	4:30 P	36.5	6 A	47.0	46.0	39.7	12.5
29	30.10	29.93	30.016	48.5	1:30 P	35.5	12 P	42.0	41.3	36.5	0.3
30	30.04	29.91	29.971	62.0	5 P	35.0	0 A	48.5	46.3	41.7	7.7

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	33.5	.250	79.5	S.S.W.	160	0.5	10	1 A	5 P	12 P	.23	
2	33.0	.202	93.0	S.S.W.	96	0.5	10	11 P	0 A	12 P	1.03	
3	23.5	.180	73.0	N.W.	350	5.5	33	1 P	0 A	7 A	.04	T
4	22.5	.181	67.0	N W.	279	1.5	17	11 A				
5	43.5	.392	81.5	S.S.W.	240	4.0	28	5 P	5 A	7 A	.10	
6	56.0	.533	85.0	S.	132	0.0	—	—				
7	42.0	.322	84.0	S.S.W.	300	9.0	43	7 P	5 P	12 P	.59	
8	24.0	.164	81.0	W.N.W.	419	7.5	39	1 P	0 A	12 M	.09	T
9	24.5	.168	81.5	S.W.	209	1.5	17	11 A	10 A	5 P	.22	1.0
10	26.0	.206	70.5	N.	176	0.5	10	5 P				
11	34.5	.263	76.5	W.N.W.	142	0.5	10	2 P				
12	34.0	.255	78.0	N.W.	55	0.0	—	—	3 P	6 P	.06	
13	40.0	.319	79.0	S.W.	88	0.0	—	—				
14	38.5	.262	90.0	E.	94	0.0	—	—	8 A	12 P	.05	
15	47.5	.417	86.0	E.S.E.	52	0.5	10	8 P	0 A	12 P	.19	
16	57.5	.521	91.5	S.S.W.	224	2.5	22	3 P	0 A	5 P	.12	
17	45.0	.432	69.0	N.	111	0.0	—	—	6 P	10 P	T	
18	39.5	.278	88.5	N.E.	148	0.5	10	8 P	0 A	12 P	.41	
19	37.0	.244	90.0	W.N.W.	212	4.0	28	6 P	0 A	9 A	.07	
20	33.5	.315	62.0	W.	206	1.5	17	2 A				
21	28.5	.339	51.0	S.S.W.	131	1.0	14	5 P				
22	48.5	.364	95.0	S.	151	2.5	22	6 P	5 A	9 P	.19	
23	37.5	.300	74.5	W.N.W.	394	10.0	45	12 M				
24	40.0	.333	77.5	W.S.W.	255	6.0	35	6 P	12 M	8 P	.05	
25	41.0	.364	70.5	N.	228	2.5	22	12 M				
26	36.0	.355	61.5	S.W	234	4.5	30	2 P				
27	47.0	.411	80 5	S.S.W.	411	7.0	37	10 P	1 A	5 P	.04	
28	31.0	.313	57.0	N.W.	396	3.0	26	5 A				
29	30.5	.248	73.0	N.N.W.	62	0.0	—	—	1 P	11 P	.44	
30	35.0	.311	70 0	N.	139	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during April was generally devoid of unusual characteristics although it hardly can be said that the advance of the season was normal. The highest temperature and warmest day occurred early in the month and the last part of the month was rather cold. Rain occurred on more than half the days and the total precipitation was rather large. A large wind movement and comparatively few clear days were other noticeable features.

An analysis of the several weather elements gives some of the more important features as related to the normals : The mean barometer was practically normal and the maximum pressure for the month one of our highest April records. The minimum record was rather low, giving a comparatively large range. The pressure was rather unsteady giving a total wind movement nearly one-sixth more than usual.

The mean temperature was practically normal although the general impression was that the month was cold. The maximum temperature was about the normal value but the minimum was above the average giving a range less than the average value for April. The warmest day was nearly 62 degrees.

The mean dew point and relative humidity was both considerably above the normal values. Only two frosts were noted during the last decade of the month and they were both light. The season had made so little progress that they caused no damage.

The total precipitation was one inch more than the normal and was well distributed throughout the month. The heaviest storm occurred on the first two days of the month. A light snowfall was noted on the 9th. A rather heavy thunder storm occurred on the night of the 15th, and early morning of the 16th.

More cloudiness than usual was noted, as would be expected from the large number of days showing precipitation.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 281. MAY, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 01, 20th, 9 A.
Minimum reduced to freezing,	29.15, 9th, 3 P.
Reduced† maximum reading,	30.31, 20th, 9 A.
Reduced† minimum reading,	29.45, 9th, 3 P.
Mean semi-daily reduced,	29.961
Monthly range,	0.86

***Air Temperature.** In Degrees Fahr.

Highest,	88.0, 24th, 1 P.
Lowest,	32.5, 1st, 6 A.
Mean hourly,	58.1
Mean of means of max. and min.,	58.8
Mean sensible (wet bulb),	53 4
Monthly range,	55.5
Highest mean daily,	70.4, 24th
Lowest mean daily,	47.0, 5th
Mean maximum,	69.7
Mean minimum,	47.8
Mean daily range,	21.9
Greatest daily range,	41.0, 21st
Least daily range,	4.5, 16th

Humidity.

Mean dew point,	50.2
Mean force of vapor,	.482
Mean relative humidity,	78.5

Precipitation. In inches.

Total precipitation,	4.34
Number of days on which .01 inch or more rain fell,	16

Wind.

Total movement,	5332m.
Greatest daily movement,	371m., 28th
Least daily movement,	78m., 30th
Mean daily movement,	172 m
Mean hourly velocity,	7.2 m

Maximum pressure per square foot, 13.5 lbs.= 52m. per hour, 17th, 1 P., W.; 19th, 3 P., W. N. W.

Maximum velocity for 5 minutes, 42 m. per hour, 17th, 1 P., W.

Prevailing Direction, Southwest.

Summary.

South Southwest	16 per cent.
South	13 " "
West	13 " "
Other directions	58 " "

Weather.

Mean cloudiness observed,	64 per cent.
Total cloudiness recorded by the Sun Thermometer,	239 hrs.=53 per cent.
Number of clear days,	7
Number of fair days,	12
Number of cloudy days,	12

Bright Sunshine.

Number of hours recorded, 214 hrs.=47%

Rain, 5th, 6th, 8th, 9th, 10th, 12th, 14th, 15th, 16th, 17th, 20th, 21st, 23d, 24th, 29th, 30th, 31st.

Frost, 1st.

Thunder and Lightning, 9th, 21st, 24th, 30th.

Hail, 9th, 21st.

Gales, 35 or more miles per hour: 44m, 14th, W.; 52m, 17th, W.; 52m, 19th, W.N.W.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum.	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.14	30.04	30.097	71.0	3:30 P	32.5	6 A	51.7	53.7	47.0	11.7
2	30.08	29.91	30.023	69.5	2 P	47.0	5 A	58.3	57.3	50.7	8.3
3	30.12	29.99	30.073	70.0	2 P	38.0	5 A	54.0	55.9	47.3	10.2
4	30.12	30.03	30.089	71.0	4 P	36.0	4:30 A	53.5	54.6	48.7	12.5
5	30.19	30.11	30.178	55.0	2:30 P	42.0	6 A	48.5	47.0	43.0	1.6
6	30.19	30.06	30.108	51.5	3 P	45.0	0 A	48.3	47.7	46.7	0.0
7	30.06	29.84	29.939	65.0	3:30 P	45.0	5:30 A	55.0	53 6	50.3	8.1
8	29.84	29 60	29.702	55.0	1:30 P	48.5	6:30 A	51.7	50.9	48.7	0.0
9	29.60	29.45	29.545	68.0	1 P	46.5	5 A	57.3	53 6	51.3	5.2
10	29.95	29.57	29.765	71.5	2:30 P	45.5	5 A	58.5	57.8	50.5	9.3
11	30.07	29.95	30.058	76.5	3 P	37.5	5:30 A	57.0	59.7	52.5	12.7
12	30.06	29.92	29 985	64.5	3 P	51.0	4 A	57.7	58.8	56 0	0.0
13	29.92	29.72	29.798	69.5	3 P	45.0	12 P	57.3	60.5	56.0	1.6
14	30 09	29.88	30.076	67.0	3:30 P	40.0	4 A	53.5	52.0	47.5	10.3
15	30.07	29.98	30.035	68.5	2 P	47.0	4 A	57.7	56.0	49.5	9.0
16	30.02	29.65	29.815	55 5	0 A	51.0	12 P	53.3	52.2	51.7	0 0
17	29.84	29 61	29 735	71.0	2:30 P	51.0	0 A	61.0	57.3	52.7	6.2
18	30.03	29.84	30.018	73.0	4 P	51.0	5 A	62.0	62.7	53.7	12.6
19	30.21	29.93	30.043	75.0	1 P	51.0	12 P	63.0	63.0	55.3	11.9
20	30.31	30.10	30.202	67.5	2:30 P	48 5	12 P	58.0	55.0	51.3	5 0
21	30.15	29.93	30.088	85.0	3 P	44 0	5 A	64.5	59.0	51.0	10.0
22	30.30	30.15	30.261	67.5	12:30 P	48.5	5 A	58.0	57.3	54.7	8.9
23	30.24	29.99	30.120	71.0	4:30 P	51.0	8 A	61.0	58.3	55.5	4.6
24	29.99	29.62	29.779	88.0	1 P	59 5	1 A	73.7	70.4	65 0	10.0
25	30.06	29.73	29.941	75.5	3 P	57.5	4 A	66.5	66.0	62.7	8.6
26	30.12	30.00	30.064	78.0	3 P	51.5	5:30 A	64.7	63.3	58.3	10.5
27	30 06	29.89	29.978	81.5	4 P	48.0	5 A	64.7	65 4	59.0	12.5
28	29 89	29.71	29.771	81.5	1 P	57.5	5 A	69.5	69.0	61.7	12.0
29	29.78	29.72	29.774	73.5	2 P	64 5	3 A	69 0	67.6	66.5	0.7
30	29.88	29.77	29.826	67.0	0 A	52 5	12 P	59.7	61.9	61.0	0.0
31	29.96	29.85	29.916	56.0	2 P	49.5	7 A	52.7	52.3	49 7	0.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Snow.
1	42.5	.395	70.0	N.W.	94	1.0	14	1 P				
2	46.0	.450	70.0	N.W.	131	0.5	10	5 P				
3	41.0	.470	55.5	N.	174	2.0	20	7 P				
4	41.5	.453	59.0	N.N.E.	147	1.0	14	8 A				
5	40.0	.308	80.0	S.	114	0.0	—	—	6 A	12 P	.05	
6	45.5	.328	94.5	S.S.E.	141	0.0	—	—	0 A	5 P	.61	
7	48.0	.402	83.0	E.	97	0.0	—	—				
8	46.5	.367	88.5	N.E.	144	0.5	10	2 P	12 M	7 P	.22	
9	49.5	.410	86.0	W.	130	1.5	17	4 P	8 A	6 P	.19	
10	44.5	.460	67.0	N.N.W.	208	3.0	24	4 P	8 A	10 A	T	
11	45.0	.521	60.5	S.S.W.	171	2.5	22	6 P				
12	54.5	.491	87.5	S.	238	2.5	22	8 P	8 A	11 P	.41	
13	53.5	.504	82.0	S.	281	3.0	24	11 P				
14	44.0	.376	77.5	W.	340	9.5	44	2 A	6 P	12 P	.11	
15	45.5	.419	72.5	S.E.	89	0.5	10	5 P	0 A	2 A	.01	
16	51.0	.395	95.5	N.E.	96	0.5	10	11 A	1 A	12 P	1.32	
17	51.0	.439	85.0	W.	188	13.5	52	1 P	0 A	6 P	.01	
18	46.5	.571	54.0	W.S.W.	190	2.0	20	2 A				
19	50.0	.579	62.0	W.N.W.	308	13.5	52	3 P				
20	49.0	.429	82.0	E.N.E.	99	1.5	17	2 P	8 A	12 M	.16	
21	48.0	.419	80.0	E.	101	4.0	28	7 P	5 P	11 P	.71	
22	53.0	.462	88.5	S.E.	153	0.5	10	5 P				
23	54.0	.480	89.5	S.	174	1.5	17	3 P	7 A	11 A	.02	
24	63.5	.669	89.0	S.S.W.	284	4.0	28	5 P	4 P	7 P	.06	
25	60.0	.657	80.0	N.	155	1.0	14	4 P				
26	55.5	.567	79.5	W.	79	0.0	—	—				
27	55.0	.615	72.5	S.S.W.	94	0.0	—	—				
28	57.5	.678	71.0	S.S.W.	371	3.5	26	5 P				
29	66.5	.670	95.5	S.S W.	290	2.0	20	8 A	6 P	12 P	.10	
30	59 5	.585	89.0	E.N.E.	78	0.0	—	—	0 A	12 P	.24	
31	48.0	.380	88.5	N.N.W.	173	1.5	17	3 P	0 A	12 P	.12	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month gave a general impression of being abnormal to an unusual degree. An examination of the records shows however that this was far from true. While there were several departures from the normal values for May, they were in no case of exceptional amount or much importance. A high dew point and relative humidity were the most marked departures from the normals.

An analysis of the records shows the following as the more important features for the month: The mean barometer and range of pressure were both practically normal and changes in pressure were generally slow and of small amount. The total wind movement was somewhat above the average and the wind directions unusually variable, only three of the sixteen directions showing ten per cent or more.

The mean temperature was slightly above the normal and the maximum and minimum records both a little higher than usual. The only frost noted was a very light one on the 1st. This date is considerably earlier than the last frost of the season usually occurs, and our records rarely show a frost after the end of May.

The mean dew point was about three degrees above the normal and the relative humidity more than ten points above the average value,—a high relative humidity being very unusual in May.

The total precipitation was a little more than one-half inch above the normal and, excepting one storm, it occurred in numerous storms of small amount. More than half the days showed a measurable amount. Two hailstorms were noted. The season however was not sufficiently advanced to have them cause much damage. Several thunderstorms occurred; two were of considerable severity.

The amount of cloudiness was a little more than usual. The month closed with the season considerably backward.

J. E. OSTRANDER, Meteorologist.

R. N. HALLOWELL, Observer.

BULLETIN No. 282. JUNE, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.01, 10th, 8 A.
Minimum reduced to freezing,	29.38, 12th, 8 P.
Reduced† maximum reading,	30.31, 10th, 8 A.
Reduced† minimum reading,	29.67, 12th, 8 P.
Mean semi-daily reduced,	29.993
Monthly range,	0.64

***Air Temperature.** In Degrees Fahr.

Highest,	91.0, 29th, 1 P.
Lowest,	36.0, 8th, 5 A.; 10th. 5 A.
Mean hourly,	65.0
Mean of means of max. and min.,	64.9
Mean sensible (wet bulb),	59.0
Monthly range,	55.0
Highest mean daily,	76.6, 29th
Lowest mean daily,	54.3, 8th
Mean maximum,	78.4
Mean minimum,	51.3
Mean daily range,	27.1
Greatest daily range,	39.0, 10th
Least daily range,	10.5, 16th

Humidity.

Mean dew point,	54.5
Mean force of vapor,	.631
Mean relative humidity,	70.0

Precipitation. In inches.

Total precipitation,	0.77
Number of days on which .01 inch or more rain fell,	7

Wind.

Total movement,	4533m.
Greatest daily movement,	292m., 30th
Least daily movement,	57m., 19th
Mean daily movement,	151 m
Mean hourly velocity,	6.3 m

Maximum pressure per square foot, 8.5 lbs.= 41m. per hour, 13th, 6 P., N.

Maximum velocity for 5 minutes, 24 m. per hour, 13th, 6P., N.

Prevailing Direction, West.

Summary.

Northwest	27 per cent.
South Southwest	13 " "
Southwest	10 " "
West Northwest	10 " "
South	10 " "
Other directions	30 " "

Weather.

Mean cloudiness observed,	43 per cent.
Total cloudiness recorded by the Sun Thermometer,	143 hrs.=31 per cent.
Number of clear days,	3
Number of fair days,	23
Number of cloudy days,	4

Bright Sunshine.

Number of hours recorded, 314 hrs.=69%

Rain, 1st, 2d, 3d, 4th, 6th, 16th, 20th, 21st, 22d, 25th.

Thunder and Lightning, 4th, 6th.

Frost on low ground, 8th, 10th.

Gales, 35 or more miles per hour: 41m, 13th, N.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximum.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.96	29.91	29.951	82.0	5 P	50.0	0 A	66.0	66.3	62.7	12.0
2	29.99	29.76	29.873	88.5	2:30 P	53.0	5 A	70.7	71.5	66.3	11.0
3	29.93	29.73	29.862	81.0	5 P	59.5	12 P	70.3	70.7	63.3	11.3
4	29.93	29.73	29.875	85.5	3:30 P	55.0	4 A	70.3	69.6	64.0	10.6
5	30.13	29.89	30.058	71.0	3 P	52.5	3:30 A	61.7	60.0	53.7	12.5
6	30.15	29.85	29.997	66.5	11 A	42.5	5 A	54.5	55.2	55.0	3.3
7	30.16	29.85	30.032	65.0	4 P	47.0	12 P	56.0	56.9	49.3	12.1
8	30.24	30.12	30.186	70.0	4 P	36.0	5 A	53.0	54.3	51.7	12.6
9	30.26	30.09	30.155	68.5	4 P	43.0	5 A	55.7	56.4	51.3	13.5
10	30.31	30.04	30.179	75.0	3 P	36.0	5 A	55.5	59.7	50.5	11.2
11	30.14	29.99	30.065	81.5	2:30 P	55.0	5:30 A	68.3	69.1	62.5	12.5
12	30.00	29.67	29.785	80.5	11:30 A	59.0	5 A	69.7	68.5	64.7	6.0
13	29.93	29.71	29.829	68.5	3 P	46.0	5 A	57.3	57.7	49.5	12.3
14	30.06	29.93	30.007	73.5	5 P	39.5	5 A	56.5	56.8	52.7	10.3
15	30.08	30.00	30.064	72.0	2 P	45.0	5 A	58.5	58.2	52.3	10.5
16	30.06	29.89	29.956	64.5	8 P	54.0	6:30 A	59.3	60.3	59.0	0.0
17	29.89	29.74	29.787	86.0	1:30 P	61.0	12 P	73.5	69.7	63.3	5.5
18	29.85	29.75	29.804	73.5	1:30 P	54.0	5 A	63.7	62.7	57.0	12.2
19	29.89	29.80	29.849	77.0	4 P	45.0	5 A	61.0	63.3	57.5	12.3
20	29.95	29.80	29.850	79.5	3 P	56.0	5 A	67.7	67.1	60.0	11.3
21	30.09	29.95	30.040	83.0	1 P	51.0	4:30 A	67.0	64.5	60.0	7.5
22	30.17	30.09	30.161	82.0	4:30 P	59.0	5:30 A	70.5	68.6	65.3	12.3
23	30.24	30.14	30.187	84.0	2 P	50.5	5 A	67.3	67.5	59.7	12.5
24	30.16	30.07	30.106	88.5	3:30 P	51.5	5:30 A	70.0	71.7	65.0	12.3
25	30.13	29.96	30.051	86.0	11:30 A	63.5	5 A	74.7	73.9	67.3	9.5
26	30.04	29.83	29.915	88.0	1 P	62.0	12 P	75.0	75.2	67.3	11.6
27	30.25	30.04	30.200	80.0	3:30 P	51.5	4:30 A	65.7	66.2	59.3	12.0
28	30.21	29.96	30.052	88.0	3 P	49.5	4 A	68.7	70.0	63.7	11.0
29	29.99	29.77	29.844	91.0	1 P	64.0	12 P	77.5	76.6	65.5	10.5
30	30.18	29.99	30.078	72.0	2 P	48.0	12 P	60.0	61.3	49.5	12.0

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches	
											Rain.**	Snow.
1	59.0	.705	71.5	N.W.	98	1.0	14	1 P	0 A	3 A	T	
2	64.0	.751	79.5	S.S.W.	123	1.0	14	11 A	11 P	12 P	.03	
3	59.5	.735	69.0	W.	221	1.5	17	9 A	0 A	4 A	.10	
4	59.0	.768	66.5	S W.	170	3.0	24	11 A	8 P	9 P	T	
5	48.5	.507	68.5	N.W.	172	1.5	17	5 P				
6	53.0	.473	85.5	S S.W.	152	1.5	17	2 P	11 A	9 P	.23	
7	42.5	.447	61.5	N.W.	257	4.0	28	1 P				
8	45 5	.434	73.5	N.N.E.	74	0.0	—	—				
9	43.5	.499	57.5	N.W.	197	2.5	22	5 P				
10	41.0	.542	48 0	W.N.W.	175	4.0	28	4 P				
11	58.0	.727	66.5	W.N.W.	151	0.0	—	—				
12	61.0	.740	74.5	W.	118	0.0	—	—				
13	43.5	.435	66.0	N.W.	251	8.5	41	6 P				
14	49 0	.478	72.0	N.	104	0.0	—	—*				
15	48.0	.473	70 5	S.	170	1.0	14	5 P				
16	58.0	.526	93 0	S.	134	1.0	14	12 M	3 A	7 P	.13	
17	61.0	.687	78 0	S.	153	0 5	10	4 P				
18	52 0	.582	68.0	N.N.W.	228	3.0	24	3 P				
19	54.0	.604	69.0	S.S.W.	57	0.0	—	—				
20	56 0	.640	71 0	N.W.	126	1.0	14	1 P	2 A	4 A	T	
21	57 0	.610	78 0	N.W.	80	0.0	—	—	2 P	9 P	.19	
22	63.0	.742	76.5	S.W.	75	0.0	—	—	2 A	4 A	.06	
23	56.0	.646	68 5	W.S.W.	78	0.0	—	—				
24	61.0	.777	70.5	W.S.W.	85	0.0	—	—				
25	66.0	.805	79.5	S.S.W.	145	0.0	—	—	4 P	9 P	.03	
26	64.0	.811	74.5	W.N.W.	198	1.0	14	3 P				
27	53.5	.654	64.0	E.	109	0.0	—	—				
28	61.5	.724	78.5	S.W.	145	0.0	—	—				
29	60.5	.885	58.5	N.W.	195	1.5	17	10 P				
30	37.5	.534	42.5	N.N.E.	292	3.5	26	2 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was marked by the unusually small amount of rainfall and large amount of sunshine. Not a single rain of as much as one-fourth of an inch occurred and even light precipation was recorded on but a few dates. The first half of the month was much cooler than the last half and the maximum temperature was above 85 degrees on only eight days. While heavy winds were unusual the total wind movement for the month was large.

Comparing the records with our twenty years' summary the following are the more noticeable features: The mean barometer was above the normal and the range less than the average amount. The pressure was generally steady and changes in pressure slow. Wind directions were mostly from western points of the compass.

The mean temperature was slightly below the normal and the maximum and minimum both slightly less than the usual values.

On two dates the temperature fell to 36 degrees in the thermometer shelter, and light frost was reported on low land on the mornings of both dates. No damage of consequence however was done. On account of the low humidity the warm days were generally not oppressive.

The mean dew point and relative humidity were both considerably below the normal.

The total precipitation was only about one-fifth the normal, making it one of the dryest Junes on our record. The last part of the month was practically without rainfall.

The total wind movement was about 20 per cent above the normal although but one gale was recorded.

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Observer.

BULLETIN No. 283. JULY, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.06, 2d, 7 A.
Minimum reduced to freezing,	29.18, 29th, 4 P.
Reduced† maximum reading,	30.35, 2d, 7 A.
Reduced† minimum reading,	29.46, 29th, 4 P.
Mean semi-daily reduced,	29.980
Monthly range,	0.89

***Air Temperature.** In Degrees Fahr.

Highest,	98.5, 8th, 3:30 P.; 9th, 2 P.
Lowest,	41.0, 1st, 4:30 A.
Mean hourly,	71.6
Mean of means of max. and min.,	71.9
Mean sensible (wet bulb),	64.1
Monthly range,	57.5
Highest mean daily,	81.6, 8th, 9th, 10th
Lowest mean daily,	61.8, 23d
Mean maximum,	84.6
Mean minimum,	59.2
Mean daily range,	25.4
Greatest daily range,	41.0, 1st
Least daily range,	6.0, 18th

Humidity.

Mean dew point,	60.5
Mean force of vapor,	.762
Mean relative humidity,	71.5

Precipitation. In inches.

Total precipitation,	2.61
Number of days on which .01 inch or more rain fell,	7

Wind.

Total movement,	3992m.
Greatest daily movement,	246m., 23d
Least daily movement,	39m., 1st
Mean daily movement,	129 m
Mean hourly velocity,	5.4 m
Maximum pressure per square foot,	5.5 lbs.= 33m. per hour, 9th, 7 P., W.N.W.
Maximum velocity for 5 minutes,	21 m. per hour, 5th, 4P., S.
Prevailing Direction,	Southwest.

Summary.

South	26 per cent
South Southwest	23 " "
North	19 " "
Other directions	32 " "

Weather.

Mean cloudiness observed,	46 per cent.
Total cloudiness recorded by the Sun Thermometer,	202 hrs.=44 per cent.
Number of clear days,	3
Number of fair days,	21
Number of cloudy days,	7

Bright Sunshine.

Number of hours recorded, 260 hrs.=56%

Rain, 11th, 14th, 18th, 21st, 29th, 30th, 31st.

Thunder and Lightning, 11th, 14th.

Gales, 35 or more miles per hour: None.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.29	30.15	30.256	82.0	4 P	41.0	4:30 A	61.5	63.3	53.5	11.7
2	30.35	30.23	30.290	87.0	3 P	52.0	6 A	69.5	70.0	61.3	11.7
3	30.27	30.08	30.179	93.5	3:30 P	56.0	5 A	74.7	74.9	66.0	12.5
4	30.13	30.03	30.067	95.5	2:30 P	60.0	4:30 A	77.7	77.2	68.0	12.0
5	30.22	30.07	30.147	93.0	2:30 P	65.5	5 A	79.7	76.9	68.0	10.8
6	30.26	30.18	30.239	93.0	2:30 P	65.0	5 A	79.0	77.3	69.5	11.5
7	30.25	30.10	30.164	94.0	3 P	64.5	5 A	79 3	78.7	66.3	11.7
8	30.12	29.99	30.059	98.5	3:30 P	69.0	6 A	83.7	81.6	65.5	10 3
9	30.05	29.95	30.013	98.5	2 P	67.0	5:30 A	82.7	81.6	71.0	9.5
10	29.99	29.83	29.908	97.0	1 P	66.5	5 A	81.7	81.6	73.3	11.5
11	29.88	29.79	29.837	89.0	2 P	71.0	4:30 A	80.0	77.9	71.7	0.0
12	30.10	29.88	29.979	89.0	4:30 P	68.5	5 A	78.7	76.3	68.0	10 2
13	30.17	30.10	30.156	83.5	3:30 P	69.0	5 A	76.3	74.4	67.7	7.0
14	30.15	30.09	30.128	84.0	2:30 P	69.5	0 A	76.7	74.4	72.3	4.3
15	30.14	29.99	30 056	88.5	4 P	69.0	5 A	78.7	76.2	69 7	0.0
16	30.17	30.01	30.013	84.0	1 P	67.0	12 P	75.5	76.4	69.3	0.0
17	30.19	30.08	30.128	81.0	3 P	58.0	5 A	69 5	70 3	63.7	9.0
18	30.11	29.90	29.991	74.0	12:30 P	68.0	5 A	71.0	69.9	69.0	0.0
19	30.18	29.81	30.023	75.5	2 P	51.5	12 P	63.5	67.6	58 0	10.7
20	30.28	30.18	30.234	79.0	2:30 P	43.5	5 A	61.3	63.2	58.0	10.3
21	30.18	29.74	29.944	67.0	8 P	60.0	2 A	63.5	64.1	63.5	0.0
22	30.01	29.73	29 921	80.5	2 P	57.5	12 P	69.0	68.5	60.0	10.5
23	30.03	29.92	29.992	72.5	3 P	52.0	12 P	62.3	61.8	53.0	11.5
24	29.92	29.68	29.770	80.0	3 P	45.0	4:30 A	62.5	63.5	56.3	11.0
25	29.68	29.59	29.602	81.0	4 P	44.0	5 A	62.5	63.4	56.5	11.8
26	29.73	29.61	29.648	83.0	4 P	53.0	4 A	68.0	68.0	61.5	10.0
27	29.92	29.73	29.824	77.5	4 P	53.5	4:30 A	65.5	66.1	58.7	11.5
28	29.92	29.70	29.802	85.0	3 P	50.5	4:30 A	67.7	70.4	63 0	9 5
29	29.70	29.46	29.567	80.0	5 P	65.0	8 A	72.5	69.1	64.7	4.7
30	29.71	29.55	29.649	83.0	4 P	61.5	5 A	72.3	69.5	62.7	8.5
31	29.86	29.71	29.808	73.5	5 P	52.0	6 A	62.7	64.0	58.7	6.2

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	45.5	.583	53.0	N.N.E.	39	0.0	—	—				
2	56.5	.727	63.0	S.S.E.	107	0.0	—	—				
3	62.0	.832	67.0	S.S.W.	112	0.0	—	—				
4	65.0	.867	71.0	S.	159	0 5	10	8 P				
5	64.0	.843	72.5	S.	190	2.5	22	5 P				
6	65.5	.890	70.5	S.	178	1.5	17	5 P				
7	68.0	.932	74.5	S.S.W.	156	0.0	—	—				
8	57.0	.986	48.0	S.S.W.	85	0.0	—	—				
9	67.5	1.003	67.0	S.S.W.	111	5.5	33	7 P				
10	70.0	1.043	70.0	S.S.W.	114	0.0	—	—				
11	70.0	.918	80.5	S.S.W.	116	0.0	—	—	6:30 P	9 P	.25	
12	64 5	.854	71.5	N.E.	83	0.0	—	—				
13	65.0	.788	79.0	S.S.W.	186	0.0	—	—				
14	72.0	.835	93.5	S.	185	0.0	—	—	5:30 A	10 A	.66	
15	68.5	.834	82.0	S.	187	0.5	10	2 P				
16	65.5	.957	66.0	S.	132	0.0	—	—				
17	60.0	.726	72.0	N.E.	117	0.0	—	—				
18	69.0	.739	94.5	S.	77	0.0	—	—	11 A	9 P	.30	
19	53 0	.637	62.5	N.W.	226	3.5	26	8 A				
20	55.0	.589	74.5	W.S.W.	139	1.0	14	1 P				
21	63.5	.615	95.0	S.	141	0.0	—	—	4 A	7 P	.85	
22	55.5	.663	66.5	N.	203	2.5	22	8 A				
23	45.5	.536	58.5	N.	246	4.5	30	5 P				
24	49.5	.613	57.0	N.	109	1.5	17	9 A				
25	51.5	.572	67.5	N.	72	0.0	—	—				
26	58.5	.639	77.5	N.	69	0.0	—	—				
27	53.0	.657	62.0	N.N.W.	123	1.0	14	2 P				
28	57.5	.792	60.0	W.	106	0.5	10	10 P				
29	62.5	.692	85.0	W.	119	0.0	—	—	7 A	10 A	.44	
30	59.5	.672	77.0	N.N.W.	58	1.5	17	6 P	3 A	6 A	.07	
31	56.5	.575	79.0	N.	47	0.0	—	—	1 P	2 P	.04	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during July was fairly normal, excepting the rainfall. More than two-thirds of the days were fair, while the number of clear days was exceptionally small. The wind was from the South or South Southwest practically all the time until after the middle of the month, and from the North points of the compass nearly all of the last half of the month : Two-thirds of the total being from three of the sixteen points of the compass. The mean daily temperature was above the mean temperature of the month on every day from the 3d to the 17th, and below, on every day after the 16th, showing a distinct change from warm to cool conditions about the middle of the month.

The maximum barometer was nearly normal, while the minimum was rather low, giving a large range for this time of year. Fluctuations in pressure were, as a rule, not rapid. The mean pressure for the month was practically normal.

The maximum temperature of 98.5 degrees was recorded on two consecutive days. This record is more than five degrees above the July average maximum at this station. The minimum was more than four degrees lower than usual, giving a large range for the month. On three consecutive days, the 8th, 9th, 10th, the average hourly temperature was above 80 degrees.

The mean dew point and relative humidity were both below the normal values.

The total precipitation was less than 60 per cent of the normal, the greater part occurring after the middle of the month.

The total wind movement was more than the normal, but not a single gale was recorded on the pressure chart.

The amount of sunshine recorded was above the average, although but three days showed more than 80 per cent of the possible amount; the percentage necessary to have a day recorded as clear.

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Observer.

BULLETIN No. 284. AUGUST, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	29.99, 17th, 8 A.
Minimum reduced to freezing,	29.24, 23d, 12 M.
Reduced† maximum reading,	30.29, 17th, 8 A.
Reduced† minimum reading,	29.52, 23d, 12 M.
Mean semi-daily reduced,	29.948
Monthly range,	0.77

***Air Temperature.** In Degrees Fahr.

Highest,	89.0, 14th, 3 P.
Lowest,	39.0, 31st, 5:30 A.
Mean hourly,	66.4
Mean of means of max. and min.,	66.4
Mean sensible (wet bulb),	61.1
Monthly range,	50.0
Highest mean daily,	78.1, 14th
Lowest mean daily,	53.0, 31st
Mean maximum,	77.5
Mean minimum,	55.3
Mean daily range,	22.2
Greatest daily range,	35.0, 17th
Least daily range,	5.5, 18th

Humidity.

Mean dew point,	58.1
Mean force of vapor,	.638
Mean relative humidity,	78.3

Precipitation. In inches.

Total precipitation,	3.22
Number of days on which .01 inch or more rain fell,	11

Wind.

Total movement,	3698m.
Greatest daily movement,	236m., 11th
Least daily movement,	35m., 2d
Mean daily movement,	119 m
Mean hourly velocity,	5.0 m

Maximum pressure per square foot, 6.5 lbs.= 36m. per hour, 23d, 1 P., W.N.W.

Maximum velocity for 5 minutes, 30 m. per hour, 23d, 1P., W.N.W.

Prevailing Direction, West.

Summary.

West	19 per cent
Northwest	19 " "
Southwest	13 " "
West Northwest	10 " "
Other directions	39 " "

Weather.

Mean cloudiness observed,	50 per cent.
Total cloudiness recorded by the Sun Thermometer,	191 hrs.=44 per cent.
Number of clear days,	1
Number of fair days,	25
Number of cloudy days,	5

Bright Sunshine.

Number of hours recorded, 238 hrs.=56%

Rain, 1st, 3d, 9th, 10th, 11th, 18th, 19th, 20th, 22d, 23d, 26th, 31st.

Thunder and Lightning, 3d, 11th, 26th.

Light Frost, 31st.

Gales, 35 or more miles per hour: 36 m, 23d, W.N.W.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	29.92	29.83	29.862	74.0	3:30 P	57.0	2:30 A	65.5	64.2	59.0	6.7
2	29.94	29.79	29.911	78.5	4:30 P	48.0	5:30 A	63.3	64.9	58.3	10.7
3	29.96	29.77	29.832	71.5	2 P	57.0	12 P	64.3	63.8	57.3	6.5
4	30.07	29.96	30.038	73.5	2:30 P	48.0	5 A	60.7	62.5	54.5	10.0
5	30.15	30.07	30.111	74.0	3:30 P	45.0	5:30 A	59.5	61.5	56.0	10.2
6	30.20	30.15	30.184	77.0	4 P	44.0	5 A	60 5	62.6	56.7	10.7
7	30.23	30.17	30.215	80.0	1:30 P	47.0	5 A	63.5	64.2	58.7	6 5
8	30.25	30.20	30.234	79.5	3 P	56.0	6 A	67.7	68.5	62.5	8.5
9	30.26	30.16	30.193	78.5	1 P	60.0	5 A	69.3	69.0	64.3	5 3
10	30.16	29.94	30.003	81.0	2:30 P	65.0	0 A	73.0	73.5	69.7	4.8
11	29.94	29.82	29 878	85.0	2 P	69.0	5 A	77.0	75.8	71.0	6.7
12	30.01	29.87	29.921	85.5	4 P	70.0	5 A	77.7	76.1	70.7	8 5
13	30.04	29.97	30.005	88.5	5 P	64.0	5:30 A	76.3	77.0	70 7	10 7
14	30.00	29.85	29.889	89.0	3 P	68.0	5:30 A	78.5	78.1	72.5	8.3
15	30.00	29.86	29.930	86.0	2 P	60.0	5:30 A	73.0	71.7	65.5	8.7
16	30.23	30.00	30.136	75.0	4:30 P	50.0	6 A	62.5	61.3	54.3	10.7
17	30.29	30.20	30.251	77.0	3 P	42.0	5:30 A	59.5	59.8	52.7	9 3
18	30.20	29.87	29.985	61.5	4 P	56.0	5 A	58.7	58.0	57.5	0.0
19	29.89	29 82	29.856	77.0	3:30 P	55.5	3 A	66.3	66.0	62.7	6.0
20	29.82	29.74	29.792	78.0	4 P	64.5	2:30 A	71.3	70 3	67.0	7.3
21	29.78	29.62	29.705	71.0	5 P	59.5	4 A	65.3	65.0	63 0	1.5
22	29.64	29.57	29.592	83.5	3 P	60.0	5:30 A	71.7	71.7	66.7	8.7
23	29.80	29 52	29.639	80.0	12:30 P	59.0	12 P	69.5	67.4	64.5	5.0
24	30.01	29.80	29.981	75.0	4 P	58.5	5:30 A	66.7	65.0	58.3	10.7
25	29.93	29.76	29.824	88.0	2 P	63.0	0:30 A	75.5	75.0	68.5	9.7
26	29.89	29.68	29.794	79.5	2 P	64.0	5:30 A	71.7	70.1	66.0	6.7
27	29.94	29 60	29.764	77.5	2 P	52.0	12 P	64.7	67.7	60.0	8.0
28	30.00	29.79	29.918	71.0	1 P	43.5	5:30 A	57.3	58.7	54.0	7.8
29	29.92	29.75	29.834	73.0	3 P	50.5	12 P	61.7	62.0	54.3	8.3
30	30.08	29.91	30.004	67.5	5 P	40.0	5:30 A	53.7	54.2	47.5	10.2
31	30.13	30.05	30.106	67.0	4 P	39.0	5:30 A	53.0	53.0	49.5	5.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	57.5	.541	89.0	N.N.E.	96	0.0	—	—	6 A	10 A	.11	
2	54.5	.582	74.5	N.E.	35	0.0	—	—				
3	53.5	.549	76.0	W.N.W.	200	3.5	26	11 A	2 A	3 A	.25	
4	49.0	.548	63.5	W.	93	0.0	—	—				
5	54.0	.503	82.0	N.W.	57	0.0	—	—				
6	53.5	.529	78.0	N.W.	51	0.0	—	—				
7	57.0	.547	85.0	W.N.W.	48	0.0	—	—				
8	59.5	.669	76.0	S.S.E.	199	1.5	17	2 P				
9	60.0	.691	76.0	S.	168	0.0	—	—	4 P	10 P	.04	
10	67.5	.813	83.0	S.	231	1 5	17	12 M	1 P	12 P	.14	
11	70.5	.815	91.0	S.S.W.	236	0.5	10	6 P	0 A	9 A	.54	
12	69.0	.853	83.0	S.W.	164	0.0	—	—				
13	67.5	.898	75.5	S.W.	100	0.0	—	—				
14	69 5	.945	76.5	S.W.	79	0.0	—	—				
15	62.5	.735	77.5	N.W.	87	0.0	—	—				
16	50.0	.522	68.0	N.N.E.	132	0.0	—	—				
17	48.5	.486	71.0	W.	39	0.0	—	—				
18	56.5	.491	94.0	S.E.	78	0.0	—	—	3:30 A	6 P	.87	
19	61.0	.645	84.0	W.	59	0.0	—	—	9:30 P	12 P	.06	
20	66.0	.719	88.5	E.N.E.	74	0.0	—	—	0 A	8 A	.55	
21	61.5	.607	92.5	W.	72	0.0	—	—				
22	64.0	.785	76.5	S.W.	104	0.0	—	—	8 P	9 P	.01	
23	62.5	.664	85.0	W.N.W.	139	6.5	36	1 P	6 A	2 P	.39	
24	54.0	.609	68.5	W.	216	1.5	17	11 A				
25	65.5	.843	75.5	W.S.W.	203	1.0	14	2 P				
26	64.0	.720	84.0	N.E.	67	0.0	—	—	4 P	5:30 P	.26	
27	56 0	.647	70.0	N.W.	188	2.0	20	1 P				
28	49.0	.507	69.0	W.	124	0.0	—	—				
29	48.5	.529	65.5	N.W.	114	0.0	—	—				
30	42.0	.398	67.5	N.N.W.	173	1.5	17	3 P				
31	46.5	.395	81.0	N.W.	72	0.0	—	—	1 P	2 P	T	

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during August was not as sultry as usual, and, excepting the period from the 10th to the 15th, inclusive, was generally devoid of high temperatures. About 80 per cent of the days were "fair" and only a single day recorded as "clear." The precipitation was considerably less than the average amount although a number of rains of moderate amount occurred.

An analysis of the records of the several weather elements shows the following as the principal features of interest: The mean barometer was unusually low for August and the maximum and minimum records were both below the normal values. The range of pressure was about 20 per cent greater than usual.

The total wind movement was about 20 per cent more than the normal and most of it was from the western points of the compass. Only one gale was noted and that was of only a few minutes duration.

The mean temperature was about one and one-half degrees below the normal and the maximum and minimum records were both lower than the normals for these features. The minimum of 39 degrees on the morning of the 31st was accompanied by a light frost on the college grounds. Signs of frost on earlier dates were reported in this vicinity but were not noted at the station. Less than one-third of the days had a mean hourly temperature in the "seventies."

The total precipitation was practically an inch less than the normal. Several of the storms were much less severe here than at other places in this valley. Several thunder storms occurred; the thunder and lightning on the 26th was especially marked.

The mean dew point was nearly two degrees lower than the normal and the relative humidity slightly greater than the average for August. The amount of bright sunshine was slightly greater than the normal.

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Observer.

BULLETIN No. 285. SEPTEMBER, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30 07, 28th, 8 A.
Minimum reduced to freezing,	29.33, 16th, 1 A.
Reduced† maximum reading,	30.37, 28th, 8 A.
Reduced† minimum reading,	29.62, 16th, 1 A.
Mean semi-daily reduced,	30.066
Monthly range,	0.75

***Air Temperature.** In Degrees Fahr.

Highest,	86.0, 11th, 12M.
Lowest,	35.0, 30th, 6 A.
Mean hourly,	61.2
Mean of means of max. and min.,	61.6
Mean sensible (wet bulb),	56 4
Monthly range,	51.0
Highest mean daily,	73.5, 15th
Lowest mean daily,	45.0, 29th
Mean maximum,	72.3
Mean minimum,	50.9
Mean daily range,	21.4
Greatest daily range,	36.5, 17th
Least daily range,	7.5, 2d

Humidity.

Mean dew point,	54.3
Mean force of vapor,	.525
Mean relative humidity,	84.0

Precipitation. In inches.

Total precipitation,	2.52
Number of days on which .01 inch or more rain fell,	14

Wind.

Total movement,	2980m.
Greatest daily movement,	258m., 16th
Least daily movement,	18m., 29th
Mean daily movement,	99.0 m
Mean hourly velocity,	4.1 m

Maximum pressure per square foot, 3.5 lbs.= 26m. per hour, 16th, 5 A., N.N.E.

Maximum velocity for 5 minutes, 20 m. per hour, 18th, 1P., SS.W.

Prevailing Direction, North Northwest.

Summary.

North Northwest	10 per cent
Northwest	13 " "
South Southwest	10 " "
North Northeast	10 " "
Southwest	10 " "
Northeast	10 " "
Other directions	37 " "

Weather.

Mean cloudiness observed, 60 per cent.

Total cloudiness recorded by the Sun Thermometer, 217 hrs.=58 per cent.

Number of clear days,	5
Number of fair days,	11
Number of cloudy days,	14

Bright Sunshine.

Number of hours recorded, 156 hrs.=42%

Rain, 1st, 2d, 3d, 4th, 5th, 6th, 7th, 15th, 16th, 18th, 19th, 20th, 24th, 29th.

Thunder and Lightning, 6th, 20th.

Light Frost, 28th, 29th, 30th.

Gales, 35 or more miles per hour: None.

*Temperature in ground shelter.

† Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.13	30.00	30.093	58.5	4 P	44.5	2 A	51.5	53.1	52.5	0.0
2	30.13	30.05	30.121	60.5	4 P	53.0	5 A	56.7	56.0	55.0	0.0
3	30.15	30.10	30.131	68.5	4 P	55.5	5 A	62.0	61.3	60.5	0.7
4	30.22	30.15	30.199	84.0	3 P	63.0	3 A	73.5	70.5	66.3	8.0
5	30.17	29.92	30.038	82.0	2 P	62.0	5:30 A	72.0	70.2	66.5	3.0
6	29.93	29.84	29.866	84.5	5 P	62.0	12 P	73.3	72.5	68.3	7.7
7	29.92	29.80	29.862	82.5	2:30 P	60.0	3 A	71.3	68.8	65.3	4.2
8	29.86	29.75	29.816	84.0	2 P	55.0	5:30 A	69.5	68.8	62 0	10 3
9	30.09	29.86	29.989	83.5	2 P	54.5	5 A	69.0	67.0	58.3	10.3
10	30.15	29.95	30.055	81.5	2 P	49.0	5:30 A	65.3	66.7	58 7	8.5
11	29.95	29.73	29.840	86.0	12 M	56.0	12 P	71.0	71.7	66.3	6 3
12	30.03	29.93	30.016	72.0	3:30 P	49 0	5:30 A	60 5	58.3	50.5	9.2
13	30.16	30.03	30.102	78.0	2 P	43.0	5:30 A	60.5	61.5	54.5	10.0
14	30.22	30.15	30.183	70.5	3 P	54.0	5 A	62.3	64.8	64.0	0.0
15	30.16	29.66	29.956	83.0	1:30 P	67.0	1:30 A	75 0	73.5	70.7	4.0
16	29.97	29.62	29.904	72.0	3 P	47.5	12 P	59.7	62.4	54.5	7 8
17	30.04	29.92	30.002	75.5	4 P	39.0	6 A	57.3	57 3	51.5	9.8
18	29.96	29.83	29.877	75.0	12 M	56 5	3 A	65.7	65.3	62.3	2.3
19	29.87	29 80	29.851	80.0	2 P	65.0	0 A	72.5	70.9	67.0	2.2
20	30.21	29 86	30.040	74.0	2 P	51.5	12 P	62.7	62.1	56.3	7 3
21	30.34	30 21	30.292	57.5	3 P	49 5	6 A	53.5	52.8	49.0	0 0
22	30.32	30.20	30.274	65.5	1:30 P	43 5	5:30 A	54.5	55.2	50 0	6 5
23	30.30	30.22	30.268	62.5	2 P	52.5	6 A	57.5	57.6	53.7	0.0
24	30.34	30.28	30.317	64.0	12 M	53.0	6 A	58.5	57.5	54.0	2.3
25	30.28	30.19	30.229	72.0	2 P	48.0	12 P	60 0	58 7	53.0	5.3
26	30.20	30.04	30.125	74.5	3 P	39 0	6:30 A	56.7	55.9	48.7	9.2
27	30.22	30.04	30.128	63.5	5 P	47.0	12 P	55.3	54.0	48.3	1.5
28	30.37	30 22	30.361	66.0	2 P	35.5	6:30 A	50.7	50.1	43.5	9.8
29	30 34	30.00	30.136	49.5	6 P	37.0	6 A	43.3	45.0	43 3	0.0
30	30.15	30 01	30.099	59.5	1:30 P	35.0	6 A	47.3	45.6	38.7	9.8

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	51.0	.413	92.0	S.W.	46	0.5	10	10 P	11 A	12 P	.18	
2	54.5	.448	95.5	N.E.	96	0.0	—	—	0 A	12 P	.24	
3	59.5	.543	96.0	N.E.	61	0.0	—	—	0 A	12 P	.24	
4	65.5	.681	92.5	N.E.	47	0.0	—	—	0 A	3 A	.10	
5	65.5	.704	89 5	S.E.	89	0.0	—	—	11:30A	1 P	.01	
6	67.0	.764	87.5	N.N.E.	82	0.0	—	—	1 A	2 P	.26	
7	64.5	.659	92.5	S.W.	103	0.0	—	—	3 A	10 A	.02	
8	60.0	.632	83.0	N.W.	82	0.5	10	12 M				
9	54.0	.617	67.5	N.W.	53	0.0	—	—				
10	55.5	.603	74.0	W.	70	0.0	—	—				
11	63.5	.792	75.0	N.W.	203	2.0	20	10 P				
12	46.0	.443	71.5	N.W.	124	0.5	10	10 A				
13	51.0	.509	73.5	W.S.W.	119	0.0	—	—				
14	62.5	.646	88.5	S.S.W.	144	1.0	14	10 A				
15	70.5	.796	92.5	S.S.W.	175	1.0	14	5 P	8 P	12 P	.34	
16	51.5	.485	82.0	N.	258	3 5	26	5 A	0 A	2 A	.50	
17	48.0	.424	81.0	W.N.W.	65	0.0	—	—				
18	61.0	.608	88.5	S.S.W.	214	2.5	22	12 M	2 P	4 P	.01	
19	67.0	.706	91.5	S.W.	138	0.0	—	—	1 P	8 P	.02	
20	55.5	.475	93.0	N.	114	0.0	—	—	4 P	11 P	.35	
21	45.5	.390	79.5	E.N.E.	78	0.0	—	—				
22	47.0	.410	80.0	S.E.	58	0.0	—	—				
23	50.5	.470	78.5	S.	101	0.0	—	—				
24	53.5	.440	91.0	S.	32	0 0	—	—	3 P	7 P	.02	
25	51.5	.444	83.5	E.N.E.	71	0.0	—	—				
26	46 5	.391	81.5	E.N.E.	39	0 0	—	—				
27	44.0	.380	76.0	N.N.E.	54	0.0	—	—				
28	40.5	.311	82.0	N.N.W.	70	0.0	—	—				
29	41.5	.300	87.5	N.N.W.	18	0.0	—	—	10 A	7 P	.23	
30	34 0	.269	73.0	N.N.W.	176	2.0	20	2 A				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during September was much more cloudy than usual, although the precipitation was comparatively small. A high relative humidity with a correspondingly high dew point was also shown by the records. The total wind movement was small, and not a single gale was noted. The force of wind instrument showed practically no wind pressure on more than two-thirds of the days, and only four days showed a pressure exceeding one pound.

Following a trace of frost on the 31st of August, no other frost was observed until the last three days of the month, when light frosts were noted. The month closed without any damage from frost in this locality.

An analysis of the records for the month shows the mean barometer was practically normal, with a less range than usual. The maximum temperature was about two degrees below the average maximum for September, and the minimum was more than two degrees higher than the normal value for this feature, giving a comparatively small range. The mean temperature was practically normal. The last three days were decidedly the coldest of the month.

The total precipitation was about 60 per cent of the normal, and occurred as numerous small storms. Two rather heavy thunder showers were noted.

Nearly half the days were cloudy or overcast, and more than 40 hours less sunshine than usual was registered on the sunshine recorder.

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Observer.

BULLETIN No. 286. OCTOBER, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing,	30.15, 21st, 9 A.
Minimum reduced to freezing,	29.30, 7th, 4 P.
Reduced† maximum reading,	30.46, 21st, 9 A.
Reduced† minimum reading,	29.59, 7th, 4P.
Mean semi-daily reduced,	30.056
Monthly range,	0.87

***Air Temperature.** In Degrees Fahr.

Highest,	83.0, 6th, 3 P.
Lowest,	26.5, 16th, 6 A.
Mean hourly,	52.4
Mean of means of max. and min.,	53.3
Mean sensible (wet bulb),	45 8
Monthly range,	56.5
Highest mean daily,	61.9, 4th
Lowest mean daily,	41.8, 16th
Mean maximum,	65.7
Mean minimum,	40.8
Mean daily range,	24.9
Greatest daily range,	45.5, 17th
Least daily range,	4.5, 25th

Humidity.

Mean dew point,	41.7
Mean force of vapor,	.369
Mean relative humidity,	74.9

Precipitation. In inches.

Total precipitation,	2.07
Number of days on which .01 inch or more rain fell,	7

Wind.

Total movement,	3953m.
Greatest daily movement,	241m., 15th
Least daily movement,	28m., 5th
Mean daily movement,	128.0 m
Mean hourly velocity,	5.3 m

Maximum pressure per square foot, 5.0 lbs.= 32m. per hour, 15th, 12 M., W.N.W.

Maximum velocity for 5 minutes, 27 m. per hour, 15th, 12 M., W.N.W.

Prevailing Direction, West.

Summary.

South	19 per cent
Northwest	16 " "
West Southwest	13 " "
West Northwest	13 " "
Other directions	39 " "

Weather.

Mean cloudiness observed,	40 per cent.
Total cloudiness recorded by the Sun Thermometer,	178 hrs.=52 per cent.
Number of clear days,	6
Number of fair days,	14
Number of cloudy days,	11

Bright Sunshine.

Number of hours recorded, 163 hrs.=48%

Rain, 1st, 9th, 10th, 11th, 12th, 19th, 23d, 24th, 25th.

Frosts, 2d, 3d, 9th, 16th, 17th, 28th, 29th.

Gales, 35 or more miles per hour: None.

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.01	29.84	29.954	58.0	12:30 P	41.0	5 A	49.5	46.5	41.0	1.0
2	30.17	30.01	30.151	57.5	3 P	35.5	7 A	46.5	45.6	38.7	8.9
3	30.11	29.91	30.004	72.5	3 P	35.0	7 A	53.7	54.2	48 3	7.3
4	30.09	29.87	29.993	74.0	3:30 P	52.0	12 P	63.0	61.9	56.3	5.8
5	30.25	30.08	30.213	81.0	3 P	43.0	7 A	62.0	59.0	50.5	9 3
6	30.23	30.04	30.142	83.0	3 P	41.0	6 A	62.0	60.0	48.7	9.5
7	30.04	29.59	29.789	82.5	2 P	41.5	6 A	62.0	59.3	49.0	8.0
8	30.19	29.79	30.107	63.0	3 P	36.0	12 P	49.5	48.0	38.5	9.0
9	30.24	30.01	30.148	61.0	3 P	33.0	2 A	47.0	49.3	44.5	1.2
10	30.21	29.98	30.108	71.0	1 P	53.0	12 P	62.0	60.0	54.0	7.3
11	30.22	30.12	30.178	55.0	7:30 P	49 5	6 A	52.3	52.2	51.0	0.0
12	30.08	29.88	29.985	69.0	6 P	53.5	5 A	61.3.	59.5	59.7	0.0
13	30.20	30.00	30.153	64.5	2:30 P	48.0	12 P	56.3	55 0	46.0	7.5
14	30.26	30.09	30.204	62.0	3 P	41 5	6 A	51.7	50.2	42.3	4.3
15	30.22	29.93	30.079	59.5	11:30 A	37.5	12 P	48.5	47.3	38.7	3.0
16	30.34	30.19	30.279	57.5	3 P	26 5	6 A	42.0	41.8	33.5	8.5
17	30.19	29.99	30.081	73.0	2 P	27.5	6 A	50.3	50.9	41.5	7.6
18	30.10	29.99	30.058	73.5	3 P	37.0	6:30 A	55.3	55.1	45.3	7.5
19	30.01	29.80	29.924	73.5	11 A	47.5	12 P	60.5	57.2	52.3	0.0
20	30.35	30.00	30.199	63.0	3 P	35 0	12 P	49.0	49.3	41.3	9.0
21	30.46	30.35	30.415	65.0	3 P	27.5	6 A	46.3	45.1	38.3	7.2
22	30.41	30.11	30.281	66.0	3:30 P	36.5	1:30 A	51 3	51.0	46 7	2.3
23	30.11	29.65	29.799	66.0	1 P	53.0	5 A	59 5	61.2	60.5	0.0
24	29.72	29.61	29.655	68.0	11 A	53.0	12 P	60 5	60.8	55.7	3.0
25	29.79	29.70	29.777	54.5	9:30 A	50.0	12 P	52.3	51.8	49.7	0.0
26	29.91	29.76	29 829	59.0	1:30 P	45.0	7 A	52.0	51.4	43.0	1.3
27	30.03	29.91	30.017	63.0	2 P	37.0	6 A	50.0	49.9	42.3	7.7
28	30.11	29.96	30 057	59.5	1 P	34 0	7 A	46.7	45.1	37.0	6.0
29	30.19	29 95	30.107	56.0	3 P	30.0	6:30 A	43.0	44.1	40.0	6.3
30	30 00	29.80	29.926	68.5	1 P	48.0	8 P	58 3	53 7	46 0	5.7
31	30.15	30.00	30.122	58.0	2 P	35.0	12 P	46.5	47.1	38.7	8.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	36.0	.297	71.0	W.S.W.	192	4.5	30	2 P	1 P	3 P	T	
2	32.5	.279	67.5	N.W.	171	0.0	—	—				
3	45.5	.400	80.5	S.	129	0.5	10	8 P				
4	55.0	.496	86.0	W.S.W.	192	0.0	—	—				
5	48.5	.404	84.0	N.W.	28	0.0	—	—				
6	43.0	.445	67.5	S.	61	0.0	—	—				
7	44.0	.419	70.0	W.S.W.	163	3.0	24	8 P				
8	30.0	.291	58 0	W.N.W.	135	0.5	10	10 A				
9	40.0	.357	69.5	S.	108	1.0	14	5 P	6 P	7P	T	
10	51.5	.472	80.0	E.	140	0.0	—	—	1 A	4 A	.07	
11	50.0	.390	93 5	N.N.E.	37	0.0	—	—	1 A	12 P	.19	
12	59.0	.546	93 5	W.	63	0.0	—	—	0 A	10 P	.05	
13	38.5	.401	58.0	N.W.	184	0.0	—	—				
14	36.5	.319	69.0	S.W.	126	0.0	—	—				
15	31.0	.289	61.5	W.N.W.	241	5.0	32	12 M				
16	23.0	.243	51.5	W.N.W.	110	0.0	—	—				
17	34.5	.335	63.0	S.S.W.	137	0.0	—	—				
18	40.5	.372	71.5	S.	146	0.0	—	—				
19	50.0	.437	82.0	S.S.W.	178	0 0	—	—	5 A	5:30 P	.04	
20	34 5	.318	63.5	N.	102	0.0	—	—				
21	34.0	.275	74.0	W.	116	0.0	—	—				
22	44.0	.362	80.5	S.	57	0 0	—	—				
23	59.5	.560	92.0	S.E.	185	0.0	—	—	2 A	12 P	1 27	
24	53.5	.507	81.5	S.S.E.	168	0.0	—	—	0 A	12 P	.18	
25	48.0	.384	87.0	S.	83	0.0	—	—	0 A	10 P	.27	
26	46.0	.357	88.5	W.S.W.	73	0.0	—	—				
27	39.0	.313	75.0	N.W.	121	0.0	—	—				
28	31.5	.256	71.0	N.N.W.	88	1.0	14	1 P				
29	37.5	.277	83.5	W.N.W.	96	0.0	—					
30	42.0	.355	76.5	N.W.	184	1.5	17	1 P				
31	33.5	.274	70.0	N.N.W.	139	0.0	—	—				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The month just closed was marked by more than the usual amount of pleasant, agreeable weather. A small precipitation, less than the usual amount of cloudiness and many mild days, all contributed to this end. Extreme and rapid changes in the records of the several weather elements were unusual and normal conditions generally prevailed.

A comparison of the records of the month with the normal values for October shows the following as the principal features: The mean barometric pressure was practically normal and the range of pressure much less than the average at this time of year. While the maximum pressure was low, the minimum was well above the usual value for this feature. The wind movement was practically normal with no gales recorded. On only eight dates was a pressure of as much as half a pound registered on the wind pressure chart.

The mean temperature was more than three degrees higher than the normal and the maximum and minimum records were both high. The range of temperature was practically normal. The daily range on the 17th of 45.5 degrees was an exceptionally large value for this locality.

The mean dew point and relative humidity were both practically normal.

The total precipitation was but little more than one-half the normal, and about three-fourths of the whole amount occurred during a single storm on the 23d-25th. This storm however was much less severe here than at many places in the western part of this state.

The rainfall however was sufficient to partly replenish the reservoirs which were low in this section. The amount of cloudiness observed was less than the normal and only about one-third of the days were recorded as cloudy.

J. E. OSTRANDER, Meteorologist.

H. W. ANGIER, Observer.

BULLETIN No. 287. NOVEMBER, 1912

Meteorological Observations

AT THE

MASSACHUSETTS AGRICULTURAL EXPERIMENT STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing, 30 19.3cth, 12 P.
Minimum reduced to freezing, 29.03, 24th, 10P.
Reduced† maximum reading, 30.50, 30ht, 12 P.
Reduced† minimum reading, 29.33, 24th, 10P.
Mean semi-daily reduced, ... 29.997
Monthly range. 1.17

***Air Temperature.** In Degrees Fahr.

Highest, ... 67.0, 6th, 3 P.
Lowest, ... 18.5, 29th, 6 A.
Mean hourly, ... 40.0
Mean of means of max. and min., ... 40.5
Mean sensible (wet bulb), ... 35 6
Monthly range. 48.5
Highest mean daily, ... 61.2, 7th
Lowest mean daily, ... 29.4, 29th
Mean maximum, ... 49.8
Mean minimum, ... 31.2
Mean daily range. 18.6
Greatest daily range, ... 33.5, 21st
Least daily range, ... 5.0, 25th

Humidity.

Mean dew point, ... 31.6
Mean force of vapor, ...244
Mean relative humidity, ... 77.2

Precipitation. In inches.

Total precipitation, ... 4.03
Number of days on which .01 inch or more rain fell, ... 6
Total snow in inches . . . . . Trace

Wind.

Total movement, ... 5037m.
Greatest daily movement, ... 420m., 25th
Least daily movement, ... 32m., 11th
Mean daily movement, ... 168 m
Mean hourly velocity, ... 7.0 m
Maximum pressure per square foot, 18.0 lbs.= 60m. per hour, 24th, 4 P., E.N.E.
Maximum velocity for 5 minutes, 40 m. per hour, 24th, 4 P., E.N.E.
Prevailing Direction, West Southwest.

Summary.

South Southwast	20 per cent
Northwest	17 " "
West Southwest	13 " "
West	10 " "
Southwest	10 " "
Other directions	30 " "

Weather.

Mean cloudiness observed, ... 51 per cent.
Total cloudiness recorded by the Sun Thermometer, ... 147 hrs.=50 per cent.
Number of clear days, ... 4
Number of fair days, ... 16
Number of cloudy days, ... 10

Bright Sunshine.

Number of hours recorded, . . 146 hrs.=50%

Rain, 1st, 7th, 8th, 13th, 14th, 24th.
Snow, 3d, 15th, 18th, 25th, 28th.
Hail, 24th.
Gales, 35 or more miles per hour: 40 m, 1st, S.W.; 36 m, 7th, S.S.W.; 60 m., 24th, E.N.E.: 36 m., 25th, W.; 35 m., 30th, W.

*Temperature in ground shelter.
Reduced to freezing and sea-level.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.08	29 46	29.741	62.0	5:30 P	33.5	3 A	47.7	44 7	45.0	0.0
2	30.02	29.66	29.887	45.0	12 M	31.5	12 P	38.3	39.3	33.7	8.2
3	30 37	30 02	30.227	39.0	2 P	21.0	7 A	30.0	29.8	25.0	5.8
4	30 49	30.29	30.402	51.0	3 P	20.5	6 A	35.7	36.5	32.0	7.3
5	30.29	30.19	30.267	63 5	4 P	39 5	7 A	51.5	48.7	42 7	7.5
6	30.27	30.08	30.187	67.0	3 P	34 5	5:30 A	50 7	51.1	46 0	7.2
7	30 08	29.46	29.724	65.5	2:30 P	55.5	0 A	60 5	61.2	59.7	0.0
8	29.77	29 43	29.691	62.5	0 A	39.0	12 P	50.7	47 7	39.3	5.0
9	29 97	29 73	29 866	47.5	2:30 P	31.0	6 A	39.3	38.8	33.5	3.2
10	30.14	29 97	30.135	47.5	3 P	27.5	7 A	37.5	36.4	29 7	7.8
11	30.11	29.93	30 035	58.5	3 P	30 0	7:30 A	44.3	43.2	38.0	7 2
12	29 98	29.82	29 907	65.0	2 P	40.0	3 A	52.5	53.0	49.7	4.0
13	30.02	29.78	29.952	57.0	0 A	42.0	12 P	49.5	46.1	43.0	0.0
14	29 83	29 75	29.812	43.0	3 A	36.0	12 P	39 5	41.0	40 3	0 0
15	30.10	29.78	29.931	46.0	2 P	32.5	8 A	39.3	37.7	34.3	5.0
16	30.22	30 09	30.187	41.0	3 P	26.0	12 P	33.0	33.6	28.0	6 0
17	30.19	29 97	30 061	43.0	3 P	23.5	3 A	33.3	32.4	30.0	6.0
18	30.16	30 01	30.112	37.0	3 P	23.5	12 P	30.3	32.1	27 0	2.5
19	30.13	29.83	29 977	44.5	3 P	19 5	7 A	32.0	31.9	27.3	7.5
20	30.08	29.84	30.001	57.0	2 P	29.5	5 A	43 3	41.1	35.7	7.5
21	30.09	29.92	30 026	62.5	3 P	29.0	7:30 A	45.7	44.5	39.0	7.5
22	29.92	29.80	29.886	57.5	1:30 P	39.0	10:30 P	48.3	47.4	39.7	6 0
23	29 98	29 84	29 918	52.5	1 P	30 0	7 A	41.3	41.3	33.7	8.0
24	29 84	29.33	29.624	44.5	9:30 P	37.0	0 A	40 7	41.0	39.5	0.0
25	29 87	29 39	29.615	38 0	0 A	33.0	5:30 A	35.5	35.2	33.5	1.0
26	30 00	29.87	29.992	41.0	12 M	33 0	12 P	37.0	36.2	31.7	0.5
27	30.19	29.98	30.112	42.0	1 P	27.0	7 A	34.5	33.9	29.5	9.0
28	30.21	29.97	30 091	33.0	5 P	25 5	12 P	29.3	29 7	26.7	0.0
29	30.31	30 08	30.232	38.5	3 P	18.5	6 A	28.5	29 4	25 0	8.0
30	30.50	30.11	30.312	44.0	1 P	29.5	12 P	36.7	36.5	30.7	8.3

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	41.5	.365	67.5	N.N.W.	92	8.0	40	6 P	12 M	7:30 P	.48	
2	28.5	.222	70.0	N.W.	225	0.5	10	1 P				
3	19.5	.150	72 0	N.W.	145	0.5	10	1 P	10:30A		T	T
4	27.0	.215	72.5	S.S.W.	181	0.5	10	3 P				
5	38.5	.314	75.0	S.	171	0.0	—	—				
6	44 0	.357	86.0	S.S.W.	195	1.0	14	8 P				
7	58.5	.537	92.0	S.S.W.	322	6.5	36	10 P	3 A	12 P	1.80	
8	35.0	.271	75.0	W.N.W.	324	3.0	24	12 M	0 A	3 A	.22	
9	29 5	.208	79.5	W.	129	1.5	17	4 P				
10	25.0	.183	75.0	W.	89	0.0	—	—				
11	34.5	.266	79.0	S S.W.	32	0.0	—	—				
12	48.5	.402	88.5	W.S.W.	101	0.0	—	—				
13	42.0	.290	90.5	E.N.E.	128	0.5	10	11 P	5 A	12 P	.45	
14	39.5	.255	94.0	S.E.	92	0.0	—	—	0 A	10 P	.58	
15	31.0	.215	83.0	S.W.	136	0.0	—	—	11:30 P		T	T
16	21.5	.175	67.0	N.W.	247	2.0	20	9 A				
17	25.0	.188	73.5	W.S.W.	99	1.5	17	6 P				
18	21.0	.169	67.5	N W.	180	1.0	14	2 P	8 A	10 A	T	T
19	22.0	.171	73.5	S.W.	108	0.5	10	2 P				
20	32.0	.230	80.5	S.S.W.	61	0.0	—	—				
21	35 5	.277	82.5	S.S W.	78	0 0	—	—				
22	34.0	.286	69.0	S.	98	0.0	—	—				
23	28.5	.224	70.5	N.N.E.	76	0.0	—	—				
24	36.5	.262	82 0	E.N.E.	264	18.0	60	4 P	10 A	10 P	.50	
25	31.5	.202	88.0	W.	420	6.5	36	2 P	11 A	10 P	T	T
26	26.0	.202	70.5	W.S.W.	269	4.5	30	2 A				
27	26.5	.179	80.0	S.W.	64	1.5	17	2 P				
28	22.0	.158	75.5	N.W.	210	4.0	28	5 P	10 A	3 P	T	T
29	19.5	.155	70.0	S.E.	205	1.0	14	2 P				
30	24.0	.198	67.0	W.S.W.	296	6.0	35	1 P				

**Rain or melted snow at base of tower. *Included in following day.

REMARKS

The weather during the month was exceptionally pleasant, especially considering the time of year, when the transition from Autumn to Winter is usually well under way. It can hardly be said that there was a single wintry day during the month. While the precipitation was considerably more than the normal, the number of either clear or fair days was large. The last week of the month was marked by considerable high wind.

The mean barometer was lower than the normal for November, and the range somewhat less than the average value; due to a low maximum and high minimum. The maximum pressure was registered at midnight on the last day of the month.

While most of the wind was from the southwest quadrant, the heaviest gale was from the opposite direction.

All the principal temperature records were higher than the corresponding normals. The mean temperature showed an excess of more than two degrees, while the minimum record was nearly seven degrees higher than the average value for that feature.

The mean dew point and relative humidity were both slightly above normal values.

The total precipitation was about twenty-five per cent more than the normal, and all of it fell during four well defined storms. The storm on the 7th–8th was much the heaviest; one-half the total for the month occurring at that time. Traces of snow were observed on several dates, but the one noted on the 28th was the only one which perceptibly whitened the ground.

The total wind movement was nearly one-fifth more than the normal, and a number of gales were recorded on the wind pressure chart.

The number of hours of sunshine was about twenty per cent more than usual for this month. The sunshine record for the last part of the month was made with the old Draper recorder, owing to the electric recorder being out of commission. The electric recorder was started again on the last day of the month.

J. E. OSTRANDER, Meteorologist

H. W. ANGIER, Observer.

BULLETIN No. 288. DECEMBER, 1912

Meteorological Observations

AT THE

MASSACHUSETTS

AGRICULTURAL EXPERIMENT

STATION.

Latitude, 42° 23′ 48.5″ N. Longitude 72° 31′ 10″ W.

Height of barometer above ground, 51 ft. Above sea level, 273.5 ft.

Height of Wind Instruments 72 ft.

MONTHLY SUMMARY.

Pressure. In inches.

Maximum reduced to freezing	30 29, 1st, 10 A.
Minimum reduced to freezing	28.84, 27th, 4 P.
Reduced† maximum reading	30.61, 1st, 10 A.
Reduced† minimum reading	29.15, 27th, 4 P.
Mean semi-daily reduced	30.009
Monthly range	1.46

***Air Temperature.** In Degrees Fahr.

Highest	65.0, 6th, 2:30 P.
Lowest	3.0, 25th, 5 A.
Mean hourly	32.9
Mean of means of max. and min.	33.1
Mean sensible (wet bulb)	28.9
Monthly range	62.0
Highest mean daily	49.1, 6th
Lowest mean daily	20.5, 9th
Mean maximum	40.8
Mean minimum	25.3
Mean daily range	15.5
Greatest daily range	37.0, 25th
Least daily range	4.0, 20th

Humidity.

Mean dew point	23.5
Mean force of vapor	.183
Mean relative humidity	75.4

Precipitation. In inches.

Total precipitation	4.04
Number of days on which .01 inch or more rain fell	8
Total snow in inches	5.0

*Temperature in ground shelter.

†Reduced to freezing and sea-level.

Wind.

Total movement	5337m.
Greatest daily movement	418m., 9th
Least daily movement	11m., 5th
Mean daily movement	172 m
Mean hourly velocity	7.2 m

Maximum pressure per square foot, 10.0 lbs.= 45m. per hour, 8th, 9 P., W.S.W.

Maximum velocity for 5 minutes, 36 m. per hour, 8th, 12 P., W.S.W.

Prevailing Direction, West Southwest.

Summary.

South Southwest	16 per cent
Northwest	13 " "
West Southwest	13 " "
West	16 " "
Southwest	13 " "
South	10 " "
Other directions	19 " "

Weather.

Mean cloudiness observed	58 per cent.
Total cloudiness recorded by the Sun Thermometer	135 hrs.=48 per cent.
Number of clear days	8
Number of fair days	11
Number of cloudy days	12

Bright Sunshine.

Number of hours recorded, 148 hrs.=5 %

Rain, 2d, 5th, 6th, 8th, 17th, 18th, 24th, 27th, 30th.

Snow, 8th, 13th, 24th, 27th.

Days of Sleighing, 4.

Gales, 35 or more miles per hour: 45 m, 8th, W.S.W.; 36m, 12th, W.; 41m., 19th, W.S.W.; 41 m., 27th, W.N.W.; 38 m., 28th, W.N.W.; 40 m., 30th, S.W.

DAILY SUMMARY.

Day.	Barometer Reduced to Sea Level.			Temperature. Ground Shelter.							No. of Hours Bright Sunshine.
	Maximun.	Minimum.	Mean. Semi-daily.	Maximum	Time.	Minimum.	Time.	Mean of Max. and Min.	Mean Hourly Draper.	Mean Sensible Wet Bulb.	
1	30.61	30 43	30 551	41.5	2:30 P	20.0	7:30 A	30.7	31.0	25.7	7.2
2	30 43	29.71	29.966	57.0	9 P	27.0	6 A	42.0	42.5	43.7	0.0
3	30.15	29.82	30.117	51.5	3 P	32.0	12 P	41.7	42.4	34.3	8.7
4	30.25	29.99	30.095	51.0	3 P	32.0	0 A	41.5	39.3	35.0	4.3
5	30.34	30.13	30.276	44.0	3 P	30.0	8 A	37.0	38.2	34.7	4.2
6	30.16	29 68	29.788	65.0	2:30 P	39.0	5 A	52.0	49.1	44.0	6.3
7	30.07	29.87	30.017	40.5	1 P	30.0	8 P	35.3	37.0	30.7	3.2
8	30.01	29.66	29.777	41.5	7 P	23.0	12 P	32.3	33.2	30 3	3.0
9	30.09	29.79	30.026	27.5	3:30 P	11.5	7:30 A	19.5	20.5	15.5	8.2
10	30.04	29.82	29 944	44.5	3 P	25.0	7:30 A	34.7	34 5	28.3	7.3
11	29.87	29.77	29 833	42.0	2 P	35.0	12 P	38 5	38.0	33.3	1.0
12	30.28	29 81	30 085	35.0	0 A	19 5	12 P	27.3	25 5	20 3	6 5
13	30.36	30.18	30.285	28.0	2:30 P	15.0	5 A	21.5	21.9	16 7	6.8
14	30.21	30.08	30.143	33.0	3 A	21.5	7 A	27.3	26.9	23.3	0.8
15	30.11	29.74	29.977	46.0	2 P	19 5	8 A	32.7	32.5	26.5	6.2
16	29 95	29.69	29.788	43.0	1:30 P	31.5	8 A	37.3	36.2	32.3	2.0
17	30 11	29.95	30.091	40.0	2 P	21.5	7:30 A	30.7	31.0	27.3	5.2
18	30.07	29 67	29.997	39.0	9 P	32.5	8 A	35 7	35 0	34.0	0.0
19	29.69	29.26	29.498	39.5	1 P	34 0	12 P	36 7	36 2	34.5	0.5
20	29 97	29 69	29.882	35.0	1 P	31.0	6 P	33 0	33.1	29.3	1.2
21	30.20	29.97	30.158	38.5	1 P	28.5	12 P	33.5	32.5	27 5	5.8
22	30.37	30.18	30.307	36.5	3 P	22.0	7:30 A	29.3	29.1	23 7	8 0
23	30.23	30.10	30.151	32.0	1:30 P	23 0	12 P	27.5	27.2	23.0	8.2
24	30.10	29.78	29 955	24 0	6 A	12.0	12 P	18.0	21.5	20.5	4 0
25	30.35	30.02	30.302	40.0	3 P	3.0	5 A	21.5	21.0	18.3	7.7
26	30.37	30 02	30.242	43.5	2:30 P	13.5	8 A	28.5	28.3	22.3	8.0
27	30.02	29.15	29 418	37.0	9 P	31.5	2 A	34 3	32.5	32.3	0.0
28	29 86	29.36	29.816	35.0	12 P	26.0	7:30 A	30.5	30 3	26.5	7.3
29	30.19	29 95	30.152	40.5	3 P	25 5	7:30 A	33.0	34.3	27.5	8.0
30	29.96	29.35	29.682	45.5	8:30 P	32.5	2:30 P	39 0	37 3	37.5	0.0
31	30.00	29.69	29 962	47.5	2:30 P	37.0	8 A	42.3	41.0	33.7	8.5

DAILY SUMMARY.

Day.	Humidity.			Wind.					Precipitation.			
	Mean Dew Point.	Mean Force vapor.	Mean Relative Humidity.	Prevailing Direction.	Total Movement in Miles.	Maximum Pressure Per Square Ft	Miles per Hour.	Time.	Beginning.	Ending.	Total in Inches. Rain.**	Total in Inches. Snow.
1	21.0	.158	74.5	W.	37	0.0	—	—				
2	42.5	.310	93.5	S.S.W.	212	5.5	33	5 P	11 A	10 P	.38	
3	28.5	.224	78 5	N.W.	218	3.5	26	4 A				
4	32.0	.223	81.0	S.	71	0.0	—	—				
5	33.5	.213	93.5	N.W.	11	0.0	—	—	5 P		T	
6	42.5	.309	90.0	S.E.	120	2.0	20	9 P	1 A	9 A	.62	
7	24 5	.196	70.5	W.	308	2.5	22	8 A				
8	24.5	.193	71 0	S.W.	207	10.0	45	9 P	7 P	8 P	T	T
9	3.5	.108	52.0	W.S.W.	418	4.5	30	10 A				
10	20.5	.183	62.5	S.	375	3.5	26	2 P				
11	26.5	.224	63.5	S.W.	171	1.5	17	8 P				
12	13 0	.123	67.5	W.	340	6.5	36	1 P				
13	5 5	.113	47.0	S.W.	263	0.0	—	—	8 P			T
14	16.5	.144	65.5	S.S.W.	39	0.0	—	—				
15	21.5	.173	74.5	S.S.W.	63	2.5	22	8 A				
16	29.5	.196	84.5	N.E.	101	2.5	22	6 P				
17	24.5	.159	85.5	N.W.	52	0.0	—	—	8 P	12 P	.02	
18	33 0	.205	91.0	S.S.W.	14	0.0	—	—	0 A	12 P	.22	
19	31.5	.214	84.5	N.W.	178	8.5	41	10 P	0 A	1 P	.34	
20	22.5	.186	66.0	W.S.W.	366	2.5	22	10 A				
21	22.0	.170	71.0	W.N.W.	116	0.0	—	—				
22	15 5	.149	60.5	W.N.W.	58	0 0	—	—				
23	17.5	.137	73.5	W.	204	0.5	10	1 P				
24	19.0	.114	93.0	N.N.W.	134	0.5	10	5 P	5 A	2 P	.19	3 0
25	16.0	.115	85 0	W.	34	0.0	—	—				
26	18.5	.140	82.5	S.	78	0.5	10	7 P				
27	29.0	.194	86.0	N.E.	98	8.5	41	11 P	1 A	8 P	1.37	2.0
28	20.5	.162	72.5	W.S W.	356	7.0	38	1 A				
29	22.0	.175	70.0	S S.W.	215	0.0	—	—				
30	34.5	.250	80.5	S.W.	137	8.0	40	10 P	5 A	6 P	.90	
31	27.5	.226	67.5	W.S.W.	343	0.5	10	1 P				

**Rain or melted snow at base of tower. *Included in following day.

Annual Summary for 1912.

Pressure. In inches.

Maximum reduced to freezing, ... 30.37, Mar. 6th, 1 A.
Minimum reduced to freezing, ... 28.41, Feb. 22d, 6 A.
Maximum reduced to freezing and sea-level, ... 30.70, Mar. 6th, 1 A.
Minimum reduced to freezing and sea-level, ... 28.72, Feb. 22d, 6 A.
Mean reduced to freezing and sea-level, ... 30.007
Annual range, ... 1.98

***Air Temperature.** In degrees Fahr.

Highest, . 98.5, July 8th, 3:30 P.; July 9th, 2 P.
Lowest, ... —19.0, Jan. 14th, 8:30 A.
Mean hourly, ... 46.5
Mean of means of max. and min., ... 46.9
Mean sensible (wet bulb), ... 41.6
Annual range, ... 117.5
Highest mean daily, ... 81.6, July 8, 9, 10
Lowest mean daily, ... —3.8, Feb. 10
Mean maximum, ... 57.6
Mean minimum, ... 36.2
Mean daily range, ... 21.4
Greatest daily range, ... 45.5, Oct. 17.
Least daily range, ... 4.0, Dec. 20

Humidity.

Mean dew point, ... 38.6
Mean force of vapor, ...375
Mean relative humidity, ... 77.3

Wind.

Prevailing direction, ... West

Summary.

Northwest, ... 16 per cent.
North, ... 11 " "
South, ... 10 " "
South Southwest, ... 14 " "
Other directions, ... 49 " "
Total movement, ... 55,897 m
Greatest daily movement, ... 578 m., Feb. 22
Least daily movement, ... 3 m., Feb. 17
Mean daily movement, ... 152 m
Mean hourly velocity, ... 6.3 m

Maximum pressure per square foot, 23.0 lbs.=68 m. per hour, Feb. 22d, 9 A., W.S.W.
Maximum velocity for 5 minutes, 52 m. per hour, Feb. 22d, 10 A., W.S.W.

Precipitation. In inches.

Total precipitation, rain or melted snow, . 38.56
Number of days on which .01 or more rain or melted snow fell, ... 117
Snow total in inches, ... 33.8

Weather.

Mean cloudiness observed, ... 52 per cent.
Total cloudiness recorded by Sun Thermometer, ... 2076 hrs.=46 per cent.
Number of clear days, ... 71
Number of fair days, ... 182
Number of cloudy days, ... 113

Bright Sunshine.

Number of hours recorded, 2390 hrs.=54 per cent

Dates of Frosts.

Last, ... May 1st
First, ... Aug. 31st

Dates of Snow.

Last, ... April 9th
First, ... Nov. 3d
Total days of sleighing, ... 61

Gales of 50 or More Miles Per Hour.

Jan. 9th, 62m., W.; Feb. 22d, 68m., W.S.W.; May 17th, 52m., W.; 19th, 52m., W.N.W.; Nov. 24th, 60m, E.N.E.

*Temperature in ground shelter.

H. W. ANGIER,
Observer.

J. E. OSTRANDER,
Meteorologist.